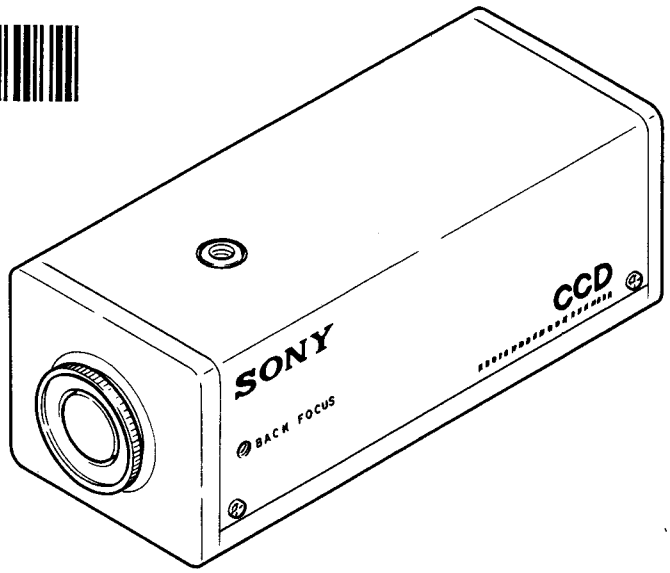
SSC-M256/M257CE/M259CE

SERVICE MANUAL

V13400



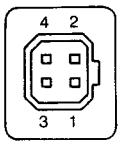
SPECIFICATIONS

Imaging system

Pickup device	Inter-line transfer type CCD
Effective picture elements	
	SSC-M256: 510 x 492 (horizontal x vertical)
	SSC-M257CE and SSC-M259CE: 500 x 582 (horizontal x vertical)
Sensing area	6.5 x 4.8 mm (9/32 x 7/32 inches)

Optical system and miscellaneous

Lens mount	CS mount
Signal system	SSC-M256: EIA standards
	SSC-M257CE and SSC-M259CE: CCIR standards
Scanning system	SSC-M256: 525 lines, 2:1 interlace, 30 frames per second
	SSC-M257CE and SSC-M259CE: 625 lines, 2:1 interlace, 25 frames per second
Synchronization	External (line-lock synchronization)
Horizontal resolution	380 TV lines
Minimum illumination	0.3 lux at F/1.2 (AGC: ON)
Video output	1.0 Vp-p, 75 ohms, sync negative
Video S/N	48 dB minimum (AGC: OFF)
Electronic iris	8 settings: 1/60 s, 1/125 s, 1/250 s, 1/500 s, 1/1000 s, 1/2000 s, 1/4000 s and 1/10000 s
Input and output connectors	
	VIDEO OUT: BNC type
	LENS: 4-pin connector (pin assignment as follows)



Rear of camera body

Pin	Signal
1	Power supply (9 V DC, 50 mA)
2	Unused
3	Video output signal for lens (0.7 Vp-p, no synchronizatior signal)
4	Ground

Power requirements	SSC-M256: 120 V AC, 60 Hz
	SSC-M257CE: 220 to 230 V AC, 50 Hz
	SSC-M259CE: 240 V AC, 50 Hz
Power consumption	4.5 W
Operating temperature	–10°C to 50°C (14°F to 122°F)
Storage temperature	–40°C to 60°C (–40°F to 140°F)
Relative humidity (operating)	20% to 80%
Relative humidity (storage)	20% to 95%
Shock resistance	70 G
External dimensions	64 x 54 x 150 mm (w/h/d) (2 5/8 x 2 1/4 x 6 inches)
Weight	SSC-M256: about 990 g (2 lb 18 oz)
	SSC-M257CE/M259CE: about 970 g (2 lb 14 oz)
Accessories supplied	Lens mount cap (1)
	4-pin plug for lens cable (1)
	Operation manual (1)

Design and specifications are subject to change without notice

CCD Black-and-White Video Camera

SONY®

TABLE OF CONTENTS

SECTION 1. GENERAL

1-1. FEATURES ····1-2
1-2. NOTES ON USE ····1-2
1-3. LOCATION AND FUNCTION OF PARTS AND CONTROLS····1-2
1-4. MOUNTING THE LENS····1-3
1-5. CONNECTIONS····1-3
1-6. CCD CHARACTERISTICS····1-3

SECTION 2. SERVICE INFORMATION

2-1. REMOVAL OF THE MAIN PARTS ····2-1
2-1-1. Removal of the Case ····2-1
2-1-2. Removal of the MB-254, PS-254 Boards····2-2
2-1-3. Removal of the BI-254 Board ····2-2
2-1-4. Removal of the CCD IMAGER····2-3

SECTION 3. THEORY OF OPERATION

3-1. BI-254 BOARD····3-1
3-2. MB-254 BOARD····3-1
3-3. PS-254 BOARD····3-2

SECTION 4. ADJUSTMENT

4-1. PREPARATION····4-1
4-1-1. Adjustment Fixture and Equipment····4-1
4-1-2. Connection for Adjustment····4-2
4-2. MECHANICAL BACK FOCUS ADJUSTMENT ···4-2
4-3. VSUB ADJUSTMENT····4-3
4-4. VCO ADJUSTMENT ····4-4
4-5. V PHASE ADJUSTMENT····4-4
4-6. PEDESTAL ADJUSTMENT····4-4
4-7. AGC LEVEL ADJUSTMENT····4-4
4-8. GAIN ADJUSTMENT ····4-5

SECTION 5. DIAGRAMS

5-1. BLOCK DIAGRAM····5-1
5-2. SCHEMATIC DIAGRAM AND PRINTED CIRCUIT BOARDS ····5-5
• BI-254, MB-254, PS-254, CB-250, CB-254 BOARDS····5-9
5-3. BOARD LOCATION····5-5
5-4. SEMICONDUCTOR PIN ASSIGNMENTS ·····5-13

SECTION 6. REPAIR PARTS

6-1 EXPLODED VIEWS AND PARTS LIST····6-1
6-2. ELECTRICAL PARTS LIST····6-3

SAFETY CHECK-OUT

(US Model only)

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Check that all control knobs, shields, covers, ground straps, and mounting hardware have been replaced. Be absolutely certain that you have replaced all the insulators.
4. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
5. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
6. Check the line cord for cracks and abrasion. Recommend the replacement of any such line cord to the customer.
7. Check the condition of the monopole antenna (if any).
   Make sure the end is not broken off, and has the plastic cap on it. Point out the danger of impalement on a broken antenna to the customer, and recommend the antenna's replacement.
8. Check the B+ and HV to see they are at the values specified. Make sure your instruments are accurate; be suspicious of your HV meter if sets always have low HV.
9. Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

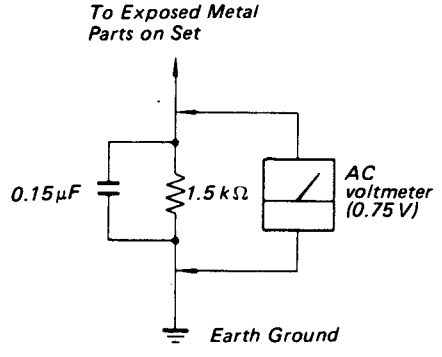


Fig. A. Using an AC voltmeter to check AC leakage.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microampers). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

HOW TO FIND A GOOD EARTH GROUND

A cold-water pipe is guaranteed earth ground; the cover-plate retaining screw on most AC outlet boxes is also at earth ground. If the retaining screw is to be used as your earth-ground, verify that it is at ground by measuring the resistance between it and a cold-water pipe with an ohmmeter. The reading should be zero ohms. If a cold-water pipe is not accessible, connect a 60–100 watts trouble light (not a neon lamp) between the hot side of the receptacle and the retaining screw. Try both slots, if necessary, to locate the hot side of the line, the lamp should light at normal brilliance if the screw is at ground potential. (See Fig. B)

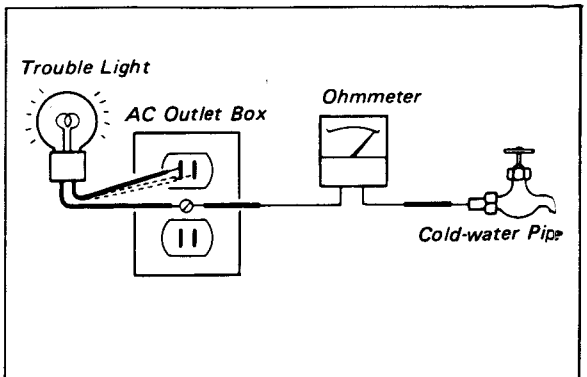


Fig. B. Checking for earth ground.

SECTION 1
GENERAL

1-1. FEATURES

The SSC-M256/M257CE/M259CE black-and-white video cameras use a 1/2-inch CCD (Charge Coupled Device) with 510 (horizontal) by 492 (vertical) picture elements for the SSC-M256 or 500 (horizontal) by 582 (vertical) picture elements for the SSC-M257CE and the SSC-M259CE. The camera is provided with the HAD (Hole-Accumulated Diode) sensor, which reduces the noise and improves the sensitivity.

High sensitivity
Gives a clear picture even under very gloomy conditions.

CCD IRIS function
When the camera is used indoors, its sensitivity is automatically adjusted to the most suitable of eight levels, according to the incident light level, even when a manual iris lens is fitted. This keeps the video signal at a suitable level.

Lockable to AC power supply
The vertical drive frequency of the camera can be locked to the AC power frequency (60Hz for the SSC-M256 and 50Hz for the SSC-M257CE and the SSC-M259CE), thus does not require cable connections for synchronization. A number of cameras can be synchronized with each other so that they can be controlled with a video switcher; you can switch from one camera to another without causing picture distortion on the monitor screen.

Auto-iris lenses
A CS-mount auto-iris lens can be used, by connecting the lens cable with the plug supplied.

1-2. NOTES ON USE

Power supply
Supply the appropriate power depending on the model.
- SSC-M256 : 120 V AC, 60Hz
- SSC-M257CE : 220 to 230 V AC, 50 Hz
- SSC-M259CE : 240 V AC, 50Hz

Ground the unit to prevent the generation of irregular voltages in the AC power cord, these may cause malfunction and/or damage to the video camera.

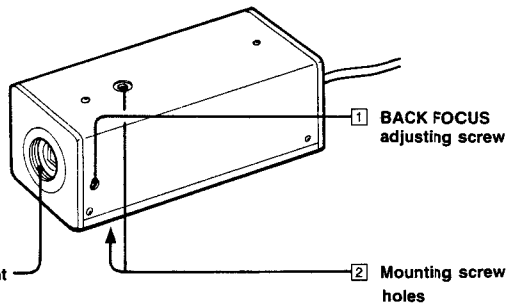
Handling of the unit
Be careful not to spill water or other liquids on the unit, or to get combustible or metallic material inside the body. If used with foreign matter inside, the camera is liable to fail, or be a cause of fire or electric shock.

Operating and storage locations
Avoid shooting a very bright object (such as light fittings) for an extended period. Avoid operating or storing the unit in the following locations.
- Extremely hot or cold places (operating temperature –10°C to +50°C; 14°F to 122°F, however, we recommend to use the unit at the temperature of –5°C to +40°C; 23°F to 104°F)
- Damp or dusty places
- Where it is exposed to rain
- Locations subject to strong vibration
- Close to generators of powerful electromagnetic radiation such as radio or TV transmitters

Care of the unit
- Remove dust or dirt on the surface of the lens or CCD with a blower.
- Clean the body with a dry soft cloth. If it is very dirty, use a cloth dampened with a small quantity of neutral detergent, then wipe dry. Avoid the use of volatile solvents such as thinners, alcohol, benzene, and insecticides. They may damage the surface finish, or impair the operation of the camera.

1-3. LOCATION AND FUNCTION OF PARTS AND CONTROLS

Front and side

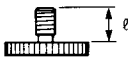


1 BACK FOCUS adjusting screw
The camera is shipped with the back focus adjusted to suit almost all lenses. If necessary, turn this screw with a screwdriver to adjust the focal plane. There is a self-locking mechanism, so that the focus will not drift after it is adjusted.

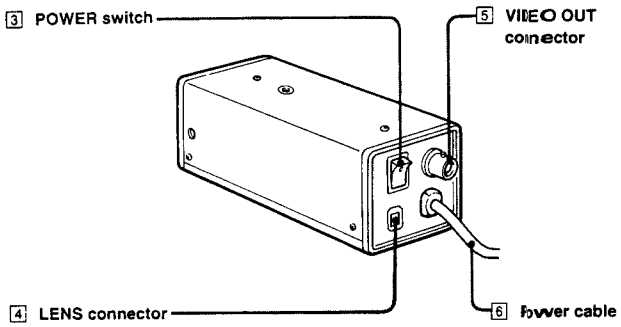
2 Mounting screw holes
Use these holes to fix the camera to a mounting bracket or tripod. The mounting screw must be as follows.

1/4" UNC (20 pitch)

ℓ : 4.5 mm ±0.2 mm (ISO standard), or 0.197" (ASA standard)



Rear



3 POWER switch
Turns the power on and off.

Note
Set the POWER switch to ON after making all connections.

4 LENS connector
When using an auto-iris or zoom lens, replace the plug on the lens cable with the plug supplied with the camera, and plug into this connector.

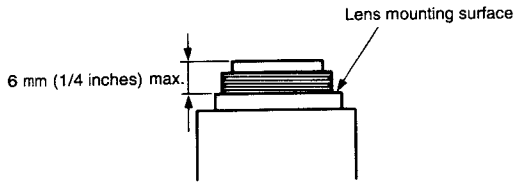
5 VIDEO OUT connector (BNC)
Connect to a video input connector.

6 Power cable
Connect to a wall outlet.

Note on the CCD IRIS switch
CCD IRIS switch is an internal switch which switches the CCD IRIS function on and off. This switch is factory-set to OFF. To change the switch setting, contact your Sony representative.

1-4. MOUNTING THE LENS

Suitable lenses
The lens must be a CS mount type, and the screw thread must not project more than 6 mm (1/4 inches) from the lens mounting surface.

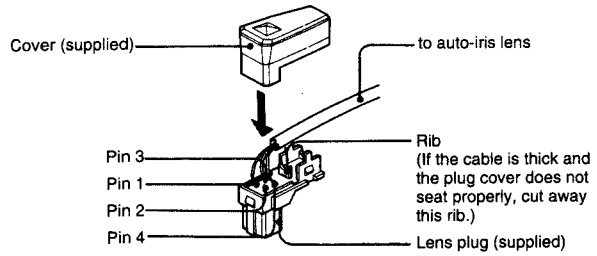


This camera uses a 1/2-inch CCD, so the CS mount type lens should be for use with this size of CCD. If used with a lens of less than 1/2-inch, the image may not cover the entire screen and the uncovered part of the screen may be dark.

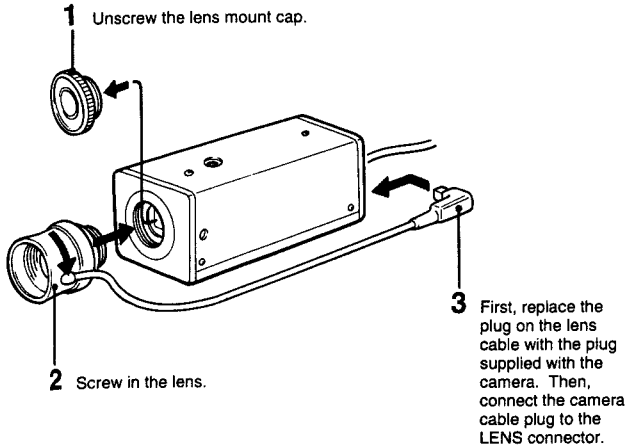
Plug fitting for an auto-iris lens
The camera is supplied with a plug to fit the LENS connector. To connect an auto-iris lens, first replace the plug on the lens cable with the plug supplied.

1 Solder the lens cable wires to the pins on the plug supplied; apply heat after putting heat shrink sleeving on the wires. The pin assignment is as follows.
Pin 1: Power supply (+9 V DC, 50 mA)
Pin 2: Unused
Pin 3: Video signal output (for auto-iris control; 0.7 Vp-p, 40 k ohms, no synchronizing signal)
Pin 4: Ground
(Refer to the operation manual for the lens to determine the cable color coding.)

2 Put the cover on the plug.



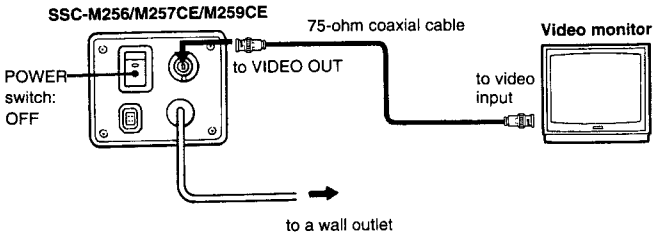
Fitting the lens
When using an auto-iris lens, fit it as follows. For a manual iris lens, omit step 3.


1 Unscrew the lens mount cap.
2 Screw in the lens.
3 First, replace the plug on the lens cable with the plug supplied with the camera. Then, connect the camera cable plug to the LENS connector.

1-5. CONNECTIONS

Make connections as follows.

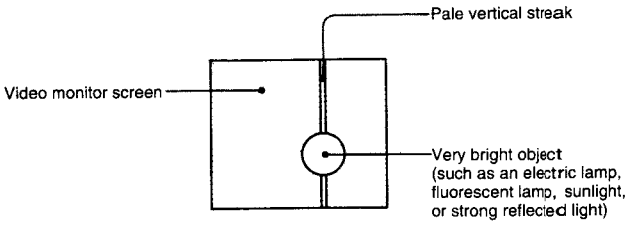
Note
Turn the power off before making connections.



1-6. CCD CHARACTERISTICS

The following conditions that may be observed when using a CCD camera are not associated with any fault of the camera.

Vertical smear
This phenomenon occurs when shooting a very bright object.


Pale vertical streak
Video monitor screen
Very bright object (such as an electric lamp, fluorescent lamp, sunlight, or strong reflected light)

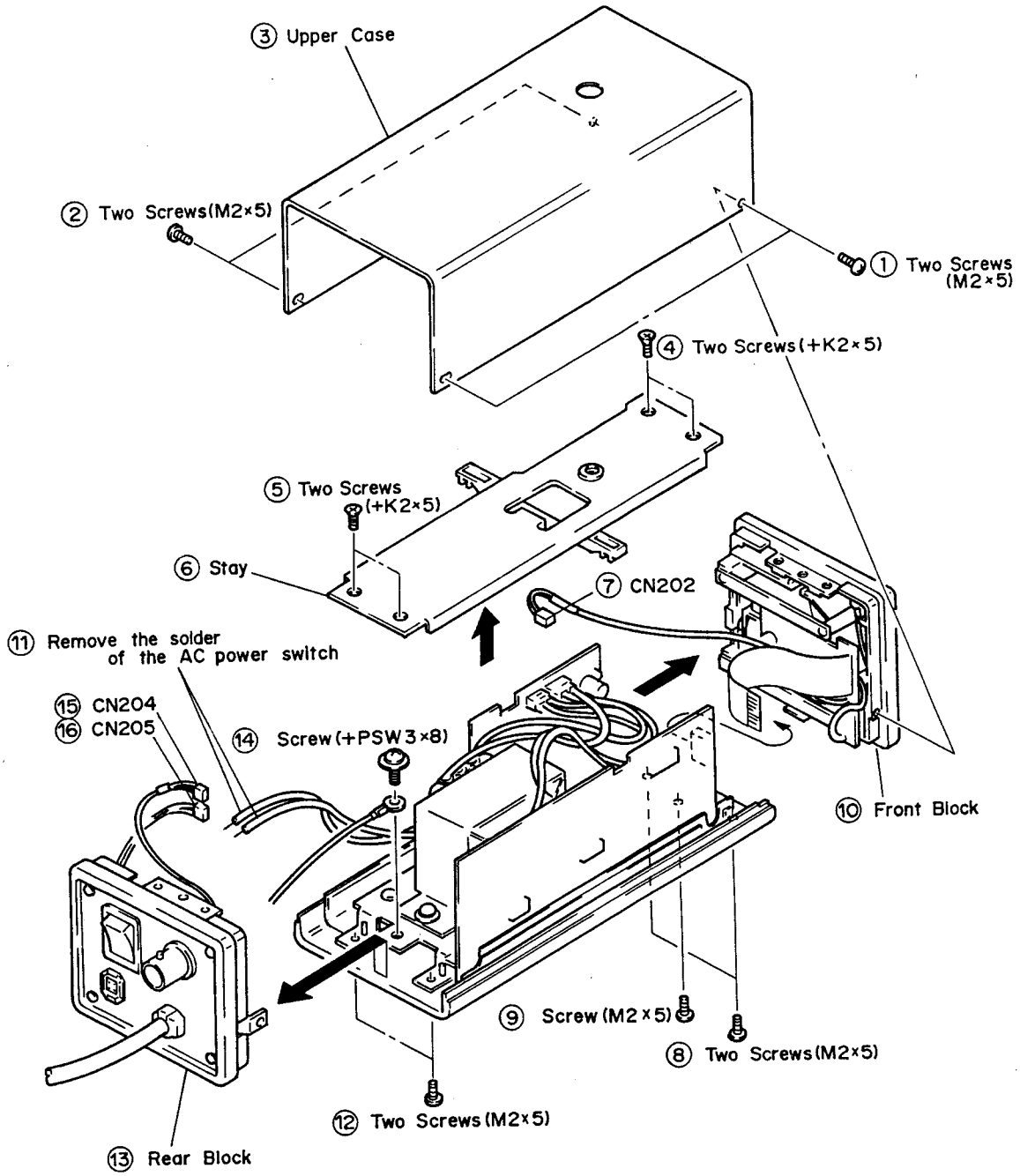
Patterned noise
This is a fixed pattern which may appear over the entire monitor screen when the camera is operated at a high temperature.

Wavy picture
When shooting stripes, straight lines, or similar patterns, the image on the screen may appear jagged.

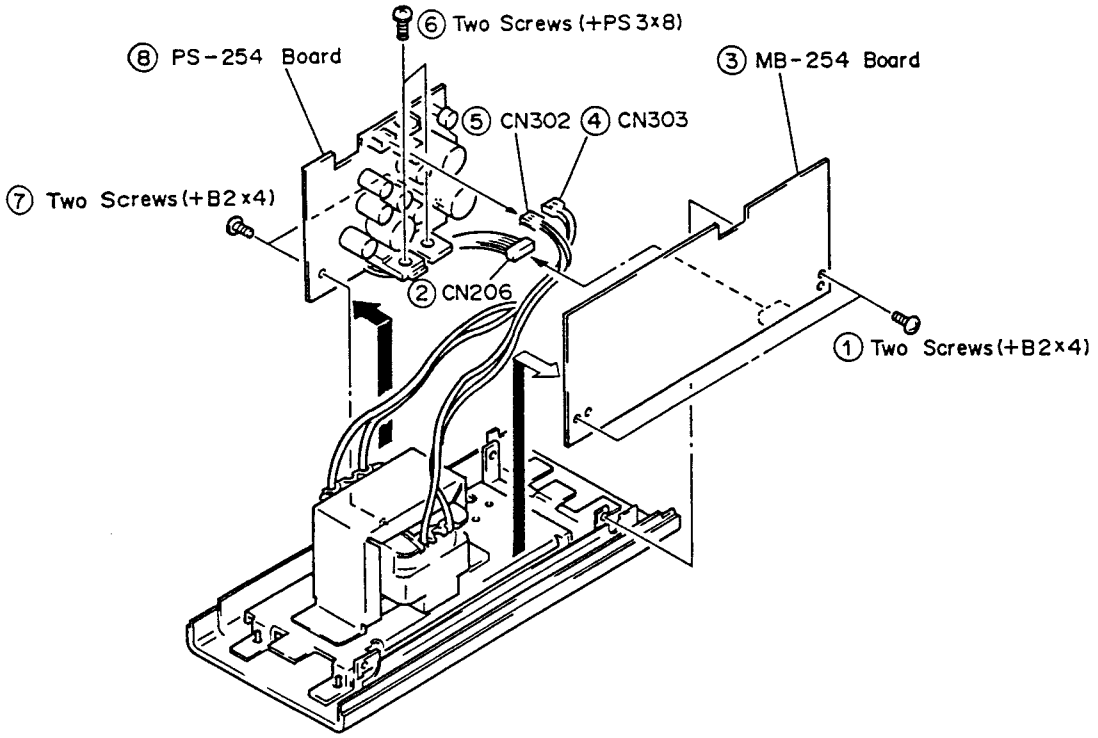
SECTION 2
SERVICE INFORMATION

2-1. REMOVAL OF THE MAIN PARTS

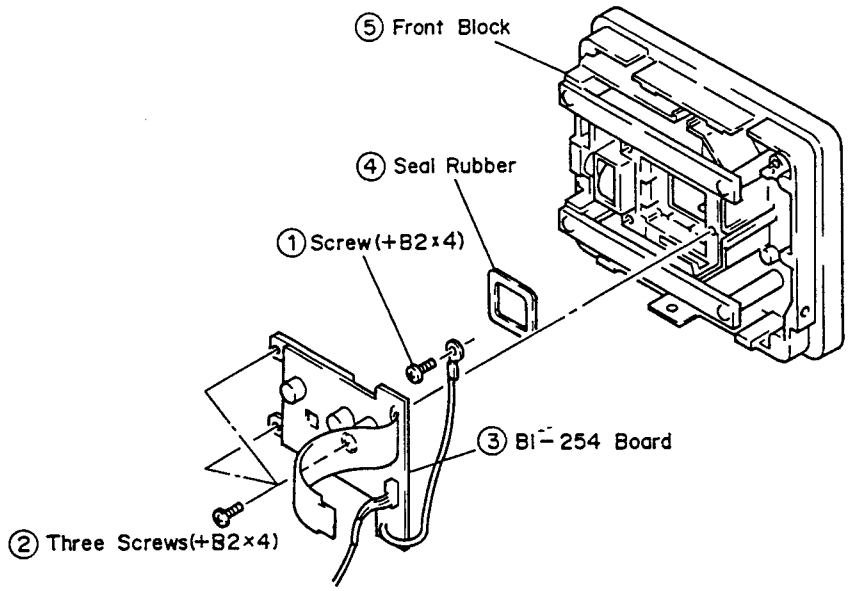
2-1-1. Removal of the Case



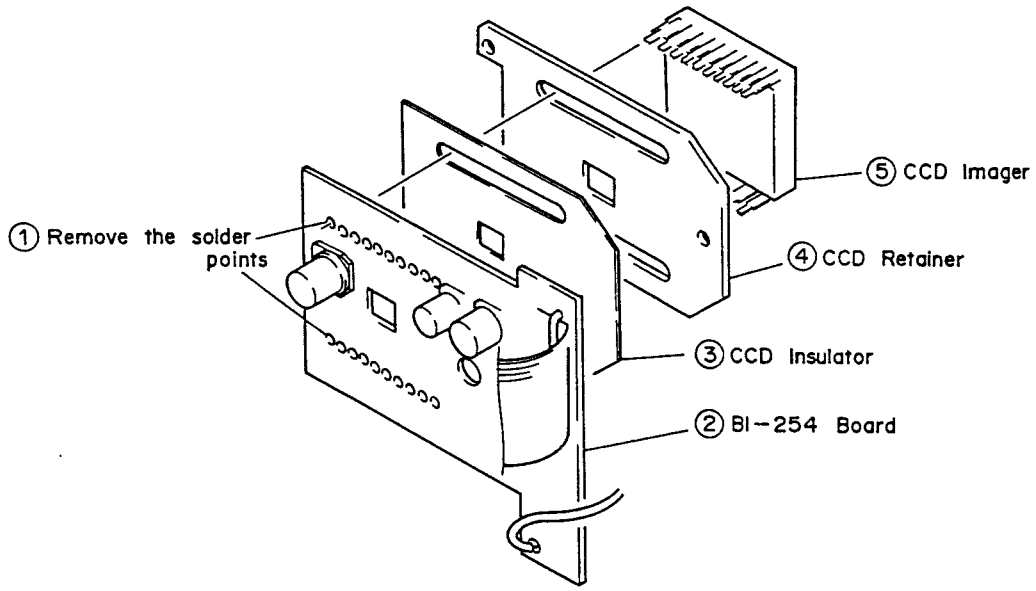
2-1-2. Removal of the MB-254, PS-254 Boards



2-1-3. Removal of the BI-254 Board



2-1-4. Removal of the CCD IMAGER



SECTION 3
THEORY OF OPERATION

3-1. BI-254 BOARD

The BI-254 board has the CCD imager which changes light into electric signals. On the CCD chip, 271,185 [320,589] photosensors are arranged in 537 horizontally and 505 [597] vertically. Among them, 250,920 [291,000] are effective picture elements arranged in 510 [500] horizontally and 492 [582] vertically.

Note: The figures in [ ] show the SSC-M254CE/M257CE/M259CE.

The incident ray is converted into charge according to the light intensity in the photosensor block, read from the photosensors to the transfer block, and transferred successively to the output block.

The transfer block has two parts; the vertical transfer block and the horizontal transfer block.
The charge converted by the photosensors is transferred for every field to the vertical block next to each photosensor. The charge which is transferred to each vertical transfer block is transferred in a vertical direction in the vertical transfer block V1, V2, V3 and V4, and transferred to the progressive horizontal transfer block.
The horizontal transfer block transfers the charge in the horizontal transfer clock H1 and H2 in a horizontal direction to the output block.

The condenser in the output block converts the charge into the voltage signal, and the signal is output from the IC101. Then it goes through the Q101 buffer and is transferred to the MB-254 board.

3-2. MB-254 BOARD

The MB-254 board has the following blocks.

① Sample and Hold/AGC/Processor — IC205(CXA1310AQ)
② Timing Signal Generator for CCD Drive — IC203(CXD1156Q)
③ CCD Vertical Transfer Clock Driver — IC201(CXD1250M)
④ Sync Signal Generator — IC204(CXD1159Q)
⑤ VCO for Master Clock Oscillation — LC-254 Board
⑥ Line Lock Synchronizer — IC206(TC5081AP), IC207(TC74HC132AF)
⑦ V SUB Voltage Supply — Q201 to Q203
⑧ CCD Iris — IC208 to IC213

① Sample and Hold/AGC/Processor
The signal output from the CCD imager is subjected to noise elimination by the sample and hold circuit.
The noise eliminated signal is input to the AGC amplifier and maintained its correct value by detecting the voltage through the external detection circuit of IC205.

The output signal of the AGC circuit is subjected to blanking mixture, γ correction, white clip and sync signal addition, then output by the driver of 75Ω .

② Timing Signal Generator for CCD Drive
Inputting the HD and VD pulses of the 28 MHz basic clock oscillation circuit output and the SYNC signal generator (IC204) makes the IC203 generate the clock, sample and hold, and clamp pulse necessary for CCD drive.

- CL : 28 MHz basic clock ÷ 2
- H1 and H2 : H register drive pulse for CCD imager.
- XV1 to XV4 : V register drive pulse for CCD imager. (With XSG1 and XSG2, output to BI-254 board through the drive circuit of IC201.)
- PG : Precharge gate pulse
- CLP1 to 4 : Various clamp pulse
- SHP and SHD : Pulse for sample and hold
- X SUB : Electric charge throwaway pulse

③ CCD Vertical Transfer Clock Driver
Drives the CCD imager V register drive pulse. This IC drives the pulses such as XV1 to XV4, XSG1 to XSG2 and X SUB which are output from IC203.

④ Sync Signal Generator
Inputting the CL signal (14 MHz) makes IC204 generates the various timing signals necessary for creating the video signals.

- SYNC : Composite sync signal
- BLK : Blanking signal
- HD and VD : Horizontal and vertical sync signals

⑤ VCO for Master Clock Oscillation
LC-254 board is the block for generating the 28 MHz basic clock of the camera master clock. The input and output are as follows.

- Oscillation frequency control input
- 28 MHz basic clock output

⑥ Line Lock Synchronizer
IC207 inputs the power supply frequency pulse created by PS-254 board to IC206 with delayed.
VD pulse created by IC204 is inverted by IC207, and also sent to IC206.
These two pulses are subjected to phase compensation by IC206 and the resultant is smoothed by LPF, then becomes the oscillation frequency control input of the LC-254 board.
The RV206 controls the delay time of the power supply frequency pulse to control the line lock phase.

⑦ V SUB Voltage Supply
This circuit supplies the specified voltage to the overflow drain of CCD imager.
Q201 to Q203 are the regulators for V SUB voltage. They can be controlled in voltage by RV201.

⑧ CCD Iris
The CCD iris circuits of IC208 to IC213 varies the shutter speed data of IC203 in 8 steps according to video signal level.
The IC208 compares the AGC detection output of IC205 with the reference value, and ups/downs the up and down counter of IC211 when the value is high/low.
IC213 stops IC211 when IC211 counter value is 0 or 1111.
IC212 generates the clock of the logic circuit.
The counter data of IC205 is input to the IC203 and the shutter speed is controlled to the correct value.

3-3. PS-254 BOARD

The PS-254 board functions for the power supply circuit system.
The low voltage side output of the transformer's secondary winding is rectified by D307 to D310 then becomes the 5V power supply by IC303 regulator.
Also, from the same winding, the power supply pulse is created by PH301.

The high voltage side output of the transformer's secondary winding is rectified by D303 to D306, then becomes the 15V power supply by IC302. Q301 and Q302 create 12V and 9V from 15V.
Also, from the same winding, –9V is output by IC301 after rectifying by D301, D302 and C318.

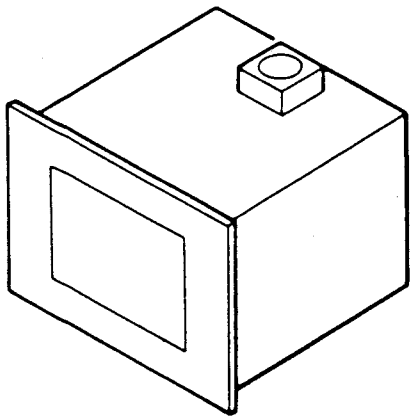
SECTION 4
ADJUSTMENT

4-1. PREPARATION

4-1-1. Adjustment Fixture and Equipment

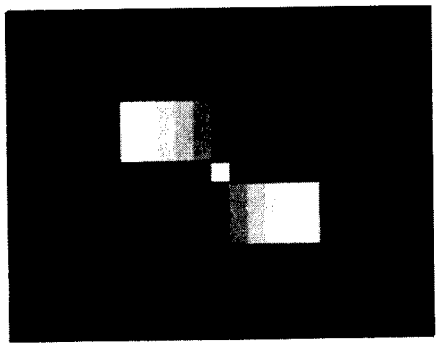
J-6029-140-A	Pattern Box PTB-500

• Light source for test chart AC90~240V



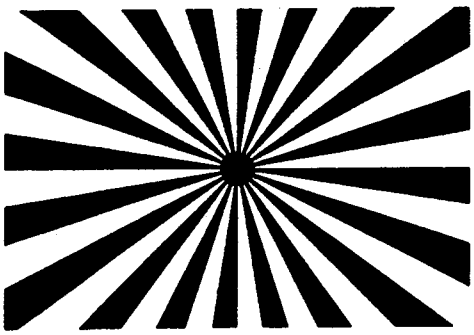
J-6026-130-B	Gray Scale Chart

• For video level and gamma adjustment



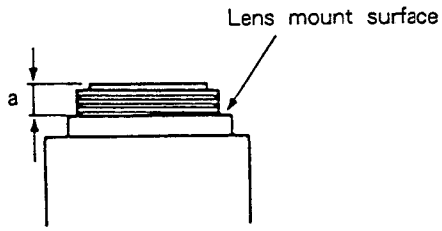
J-6024-340-B	Siemens Star Chart

• For back forcus adjustment



Commercial measuring equipment and fixture

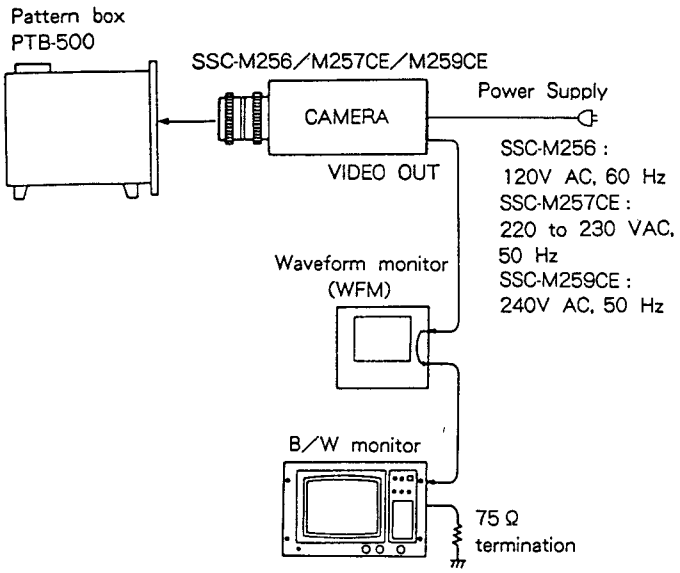
- Dual Trace Oscilloscope
- Waveform Monitor (WFM)
- Digital Voltmeter
- B/W Monitor
- Lens (1/2 inch CS mount and manual iris type)



a: should be under 6 mm

- ND Filter
  ND25 (25%) 50 mm Square made by Kenko: 2 pcs
  ND13 (13%) 50 mm Square made by Kenko: 1 pc

4-1-2. Connection for Adjustment

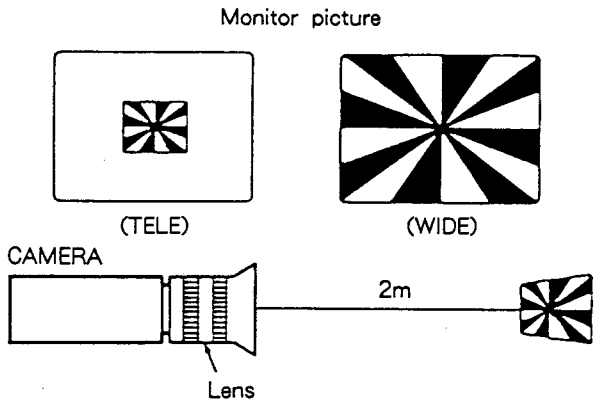


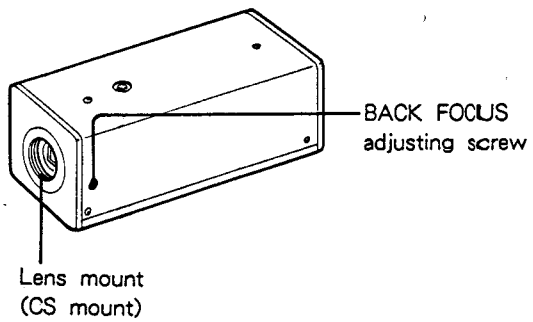
Note:
To adjust exactly, use the manual iris lens of a CS mount type.

4-2. MECHANICAL BACK FOCUS ADJUSTMENT

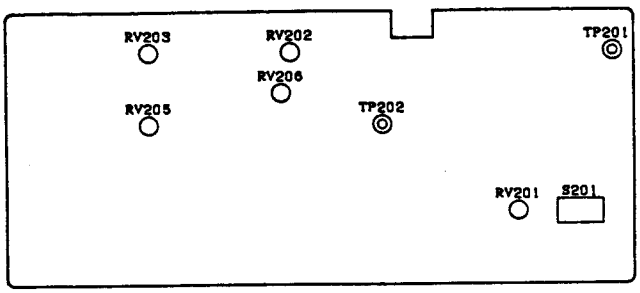
Subject : Siemens Star chart
Lens iris : Open
Equipment : B/W monitor
Test point : VIDEO OUT
Adjust:

1. Set the zoom control at TELE so as to obtain the maximum multiplication factor. Optically focus the image so as to obtain the maximum resolution.
2. Set the zoom control at WIDE so as to obtain the minimum multiplication factor. Do not optically focus the image at this time.
   Check whether the image is focused, on the monitor while turning the zoom control from TELE to WIDE.
   If the image is not focused, properly set at back focus as follows.
3. When the zooming mechanism is set at WIDE, turn the back focus adjusting screw.
4. Repeat step 1 through 3 several times.

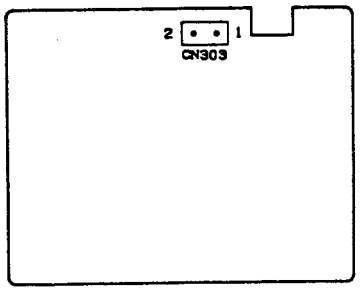




MB-254 BOARD –B SIDE–



PS-254 BOARD –B SIDE–



4-3. VSUB Adjustment

Object : Close "C"
Equipment : Digital voltmeter (DC range)
Measurement point : TP201 (MB-254 Board)
Adjustment point : RV201 (MB-254 Board)
Specification : Setting value ± 0.1V
Adjustment method : Set S201 (MB-254 Board) to OFF.

<Setting value>
Refer to the code on the back side of the CCD imager.
VSUB setting value is indicated in a 2-digit code.

2-digit code indication: □□
└.....decimal
.....integer

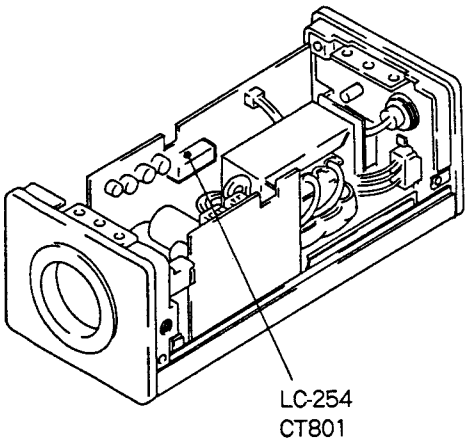
The code integer and the real value correspond with each other as follows.

Code integer	7	8	9	A	B	C	D
Real Value	7	8	9	10	11	12	13
Code integer	E	F	G	H	I	J	
Real Value	14	15	16	17	18	19	

(example) F5=15.5 (V)

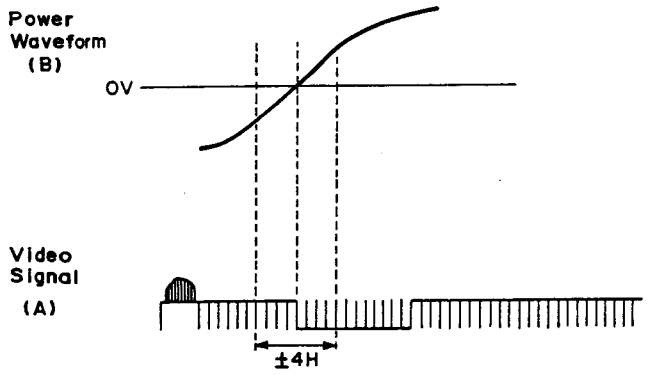
4-4. VCO Adjustment

Object : Close "C"
Equipment : Digital voltmeter (DC range)
Measurement point : TP202 (MB-254 Board)
Adjustment point : CT801 (LC-254 Board)
Specification : 2.8 ± 0.1V
Adjustment method : Confirm that line frequency is 60 ± 0.1Hz (EIA)/50 ± 0.1Hz (CCIR) and Line Lock is operates.



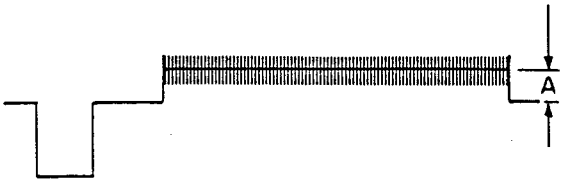
4-5. V Phase Adjustment

Object : Close "C"
Equipment : Oscilloscope CH-A (AC100mV/DIV)
CH-B (AC3V/DIV)
Measurement point : CH-A VIDEO OUT
CH-B CN303 pin 1 (PS-254 Board)
Adjustment point : RV206 (MB-254 Board)
Adjustment method : Adjust RV206 so that 0 Volt crossing point of line wave and video signal is set within ± 4H as follows.



4-6. Pedestal Adjustment

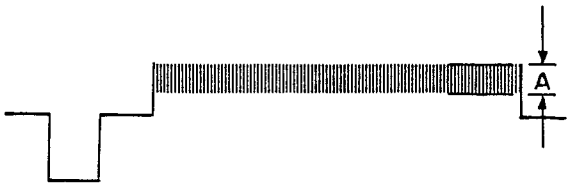
Object : Close "C"
Equipment : Waveform monitor
Adjustment point : RV205 (MB-254 Board)
Specification : A=7 ± 2 IRE (EIA)
A=30 ± 15mV (CCIR)



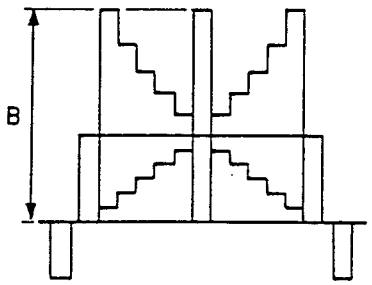
4-7. AGC Level Adjustment

Object : Gray scale chart
Equipment : Waveform monitor
Adjustment point : RV203, RV202 (MB-254 Board)
Specification : B=100 ± 2 IRE (EIA)
B=714 ± 14mV (CCIR)

Adjustment method:
1) Set a lens iris to close "C".
2) Adjust RV203 so that A is maximum.



3) Set a lens iris to "F8".
4) Install a ND filter (13%) to lens.
5) Adjust RV202 so that B is specification value.

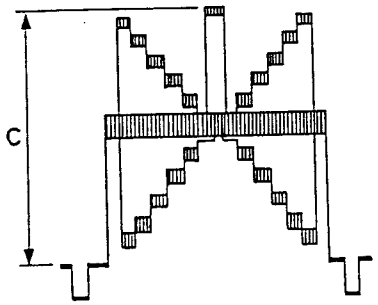


4-8. Gain Adjustment

Object : Grayscale chart
Equipment : Waveform monitor
Adjustment point : RV203 (MB-254 Board)
Specification : C=50 ± 2 IRE (EIA)
C=357 ± 14mV (CCIR)

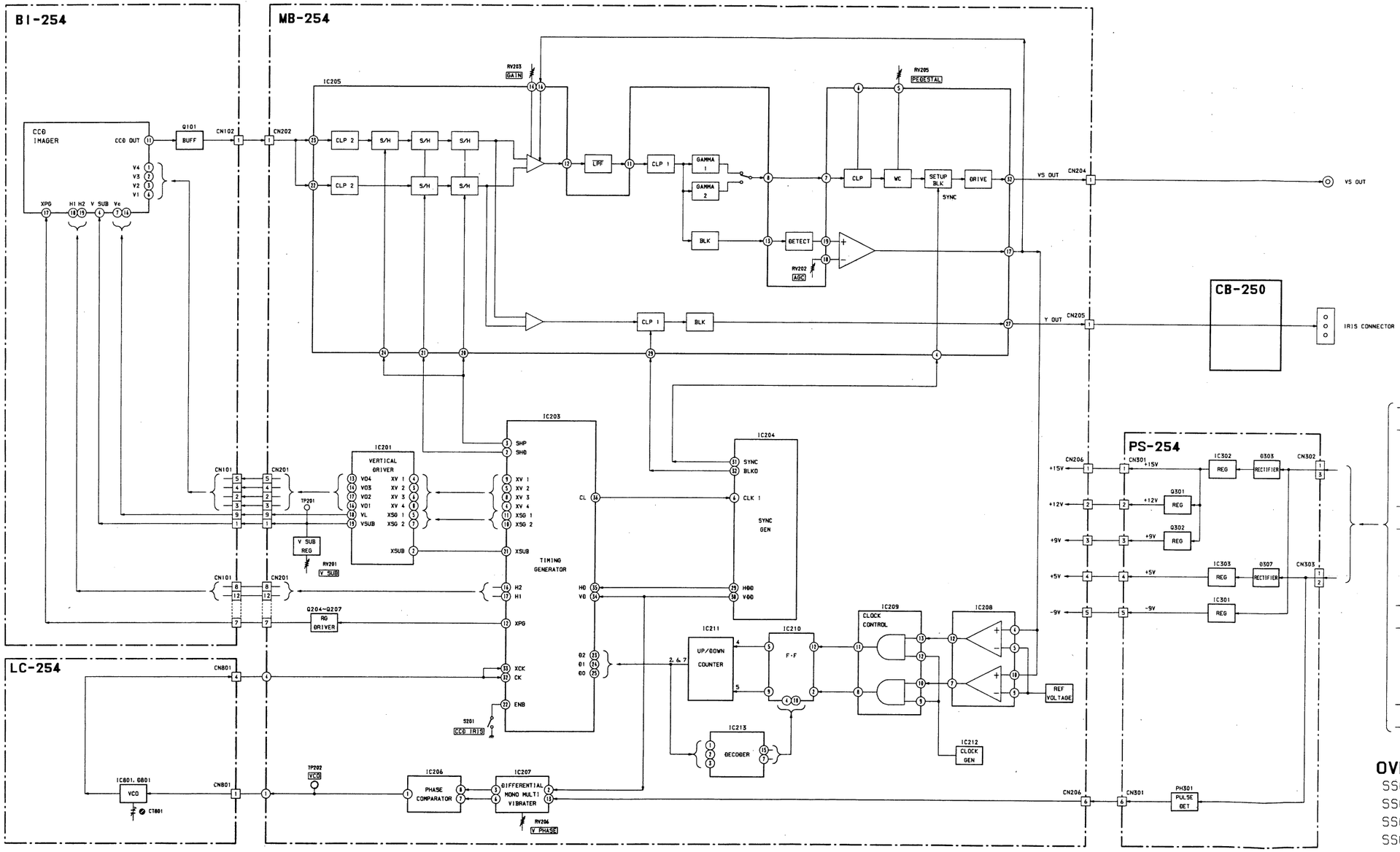
Adjustment method:

1) Set a lens iris to "F5.6".
2) Install 2 pieces of ND filter (13%) and 1 piece of ND filter (25%) to lens.
3) Adjust RV203 so that C is specification value.



SECTION 5
DIAGRAMS

5-1. BLOCK DIAGRAM



OVERALL BLOCK

SSC-M254/M254CE (UC/EK)
SSC-M256 (UC)
SSC-M257CE (AE)
SSC-M259CE (UK)

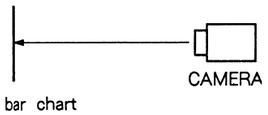
5-2. SCHEMATIC DIAGRAM AND PRINTED CIRCUIT BOARDS

Note: The components identified by shading and mark ⚠ are critical for safety. Replace only with part number specified.

Note:

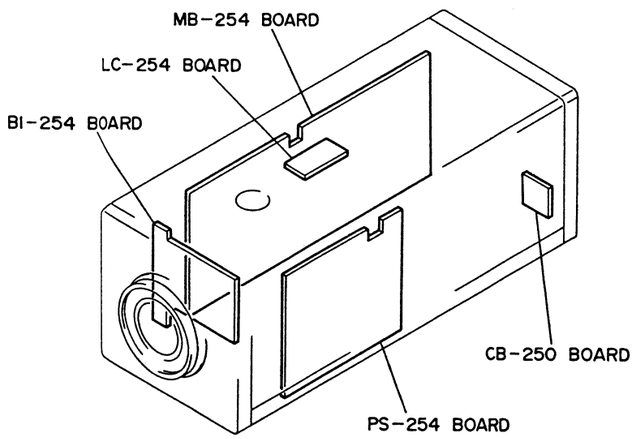
- All resistors are in ohms, 1/16W unless otherwise noted. kΩ =1000 Ω , MΩ =1000kΩ
- All capacitors are in μF unless otherwise noted. p: μμF 50V or less are not indicated except for electrolytic and tantalums.
- Readings are taken with a 10MΩ digital multimeter.
- Voltages are dc with respect to ground unless otherwise noted.
- Voltage variations may be noted due to normal production tolerances.
- All voltages are in V.
- Circled numbers are waveform references.
- — : B + bus
- – – – : B – bus
- ➡ : signal path
- — : GND

- Waveforms are measured in condition below.

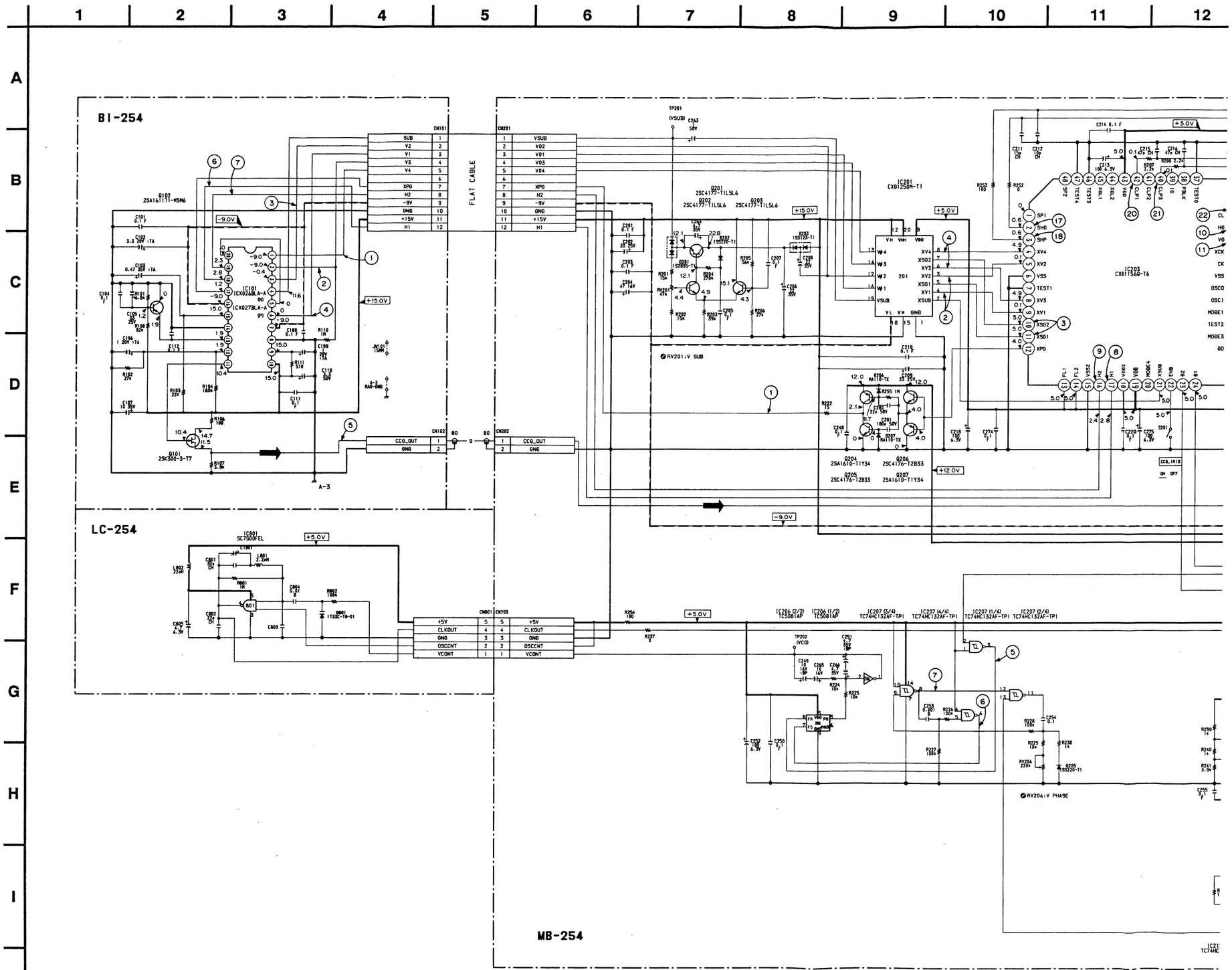


color bar chart

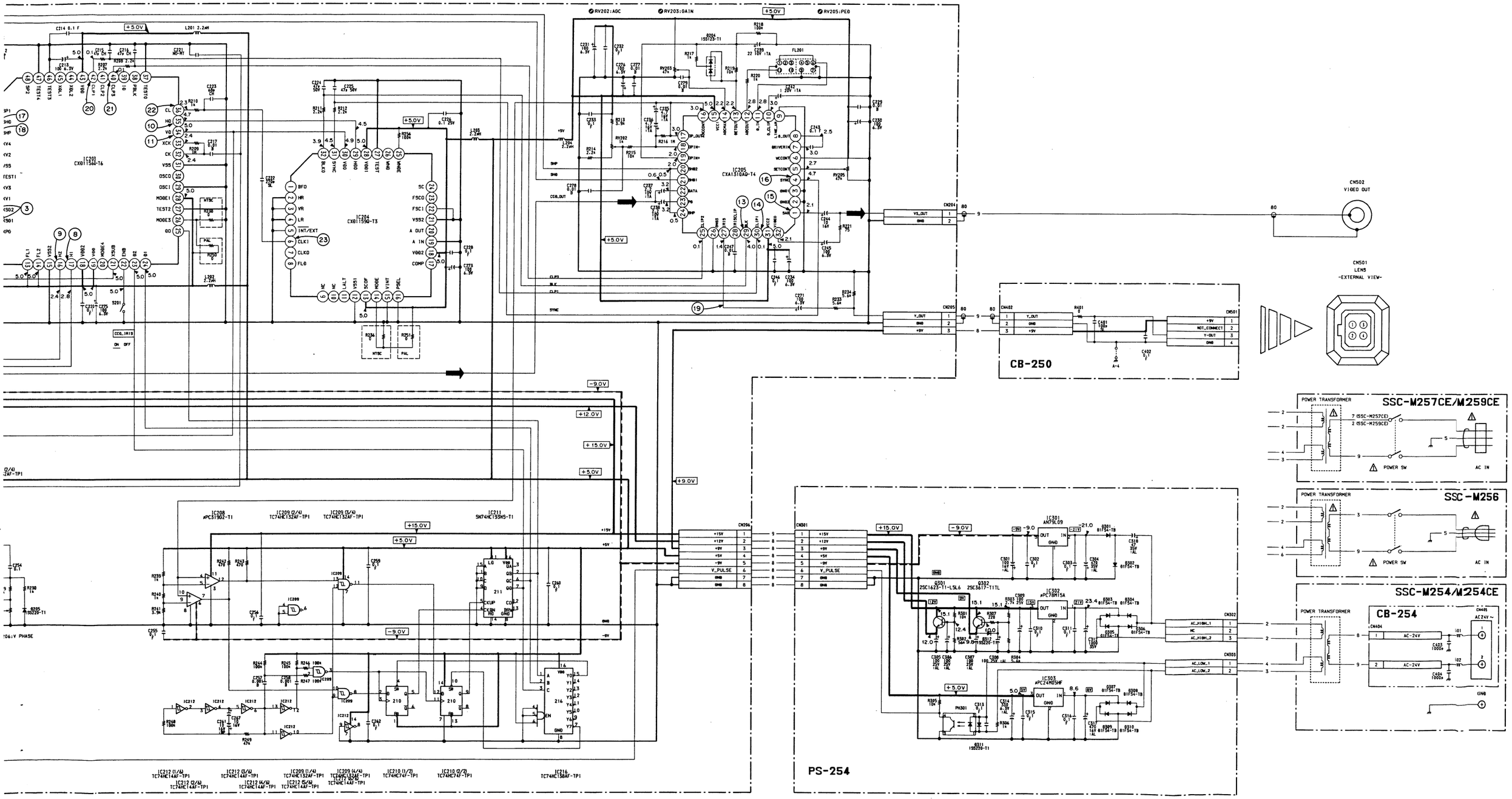
5-3. BOARD LOCATION



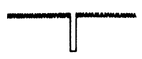
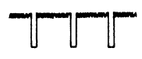
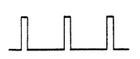
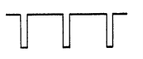
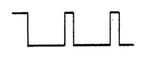
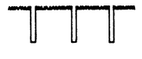
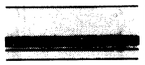
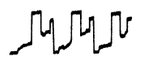
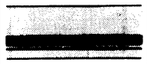
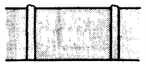
SSC-M256/M257CE/M259CE



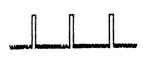
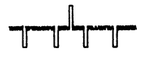
11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26



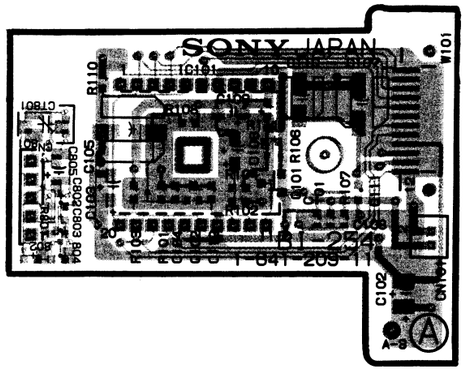
Waveform – MB-254 –

① 5.0Vp-p (H)	② 5.0Vp-p (H)	③  5.0Vp-p (H)	④  5.0Vp-p (H)
⑤  5.0Vp-p (V)	⑥  5.0Vp-p (V)	⑦  5.0Vp-p (V)	⑧ 5.0Vp-p
⑨ 5.0Vp-p	⑩ 5.0Vp-p (H)	⑪  5.0Vp-p (V)	⑫ 5.0Vp-p (V)
⑬ 5.0Vp-p (H)	⑭ 5.0Vp-p (H)	⑮ 0.9Vp-p (H)	⑯ 4.8Vp-p (H)
⑰  5.6Vp-p (H)	⑱ 5.6Vp-p (H)	⑲  1.5Vp-p (H)	⑳ 5.0Vp-p (H)
㉑ 5.0Vp-p (H)	㉒  6.2Vp-p (H)	㉓  2.5Vp-p (H)	

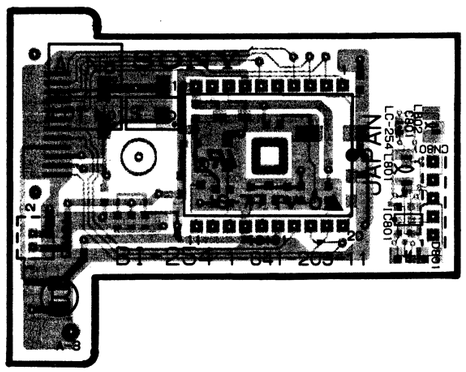
Waveform – BI-254 –

①  9Vp-p	② 24.0Vp-p
③ 9Vp-p	④  24.0Vp-p
⑤ 0.8Vp-p	⑥ 11.1Vp-p
⑦ 5.0Vp-p	

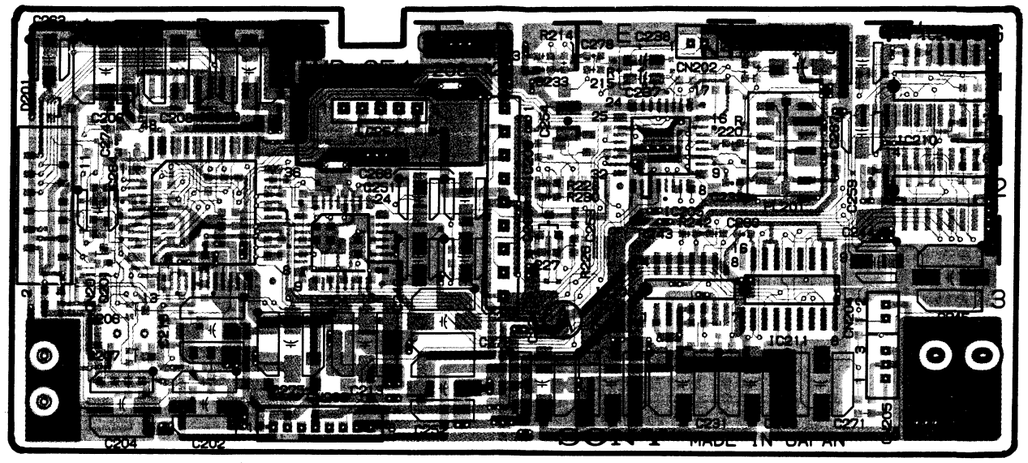
BI-254
-(A)SIDE-
1-641-209-11



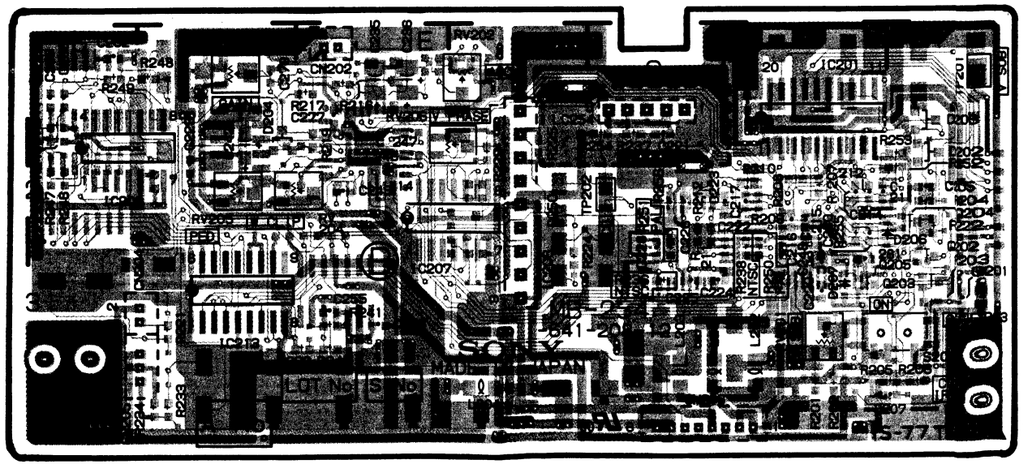
BI-254
-(B)SIDE-
1-641-209-11



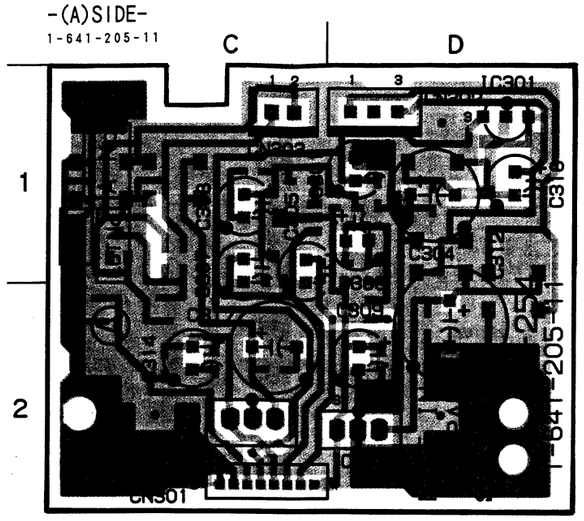
MB-254
-(A)SIDE-
1-641-208-12



MB-254
-(B)SIDE-
1-641-208-12

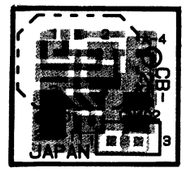


PS-254
-(A)SIDE-
1-641-205-11

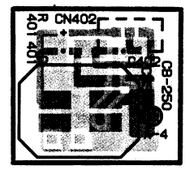


IC	
IC301	D-1
IC302	D-2
IC303	C-2

CB-250
-(A)SIDE-
1-641-206-11



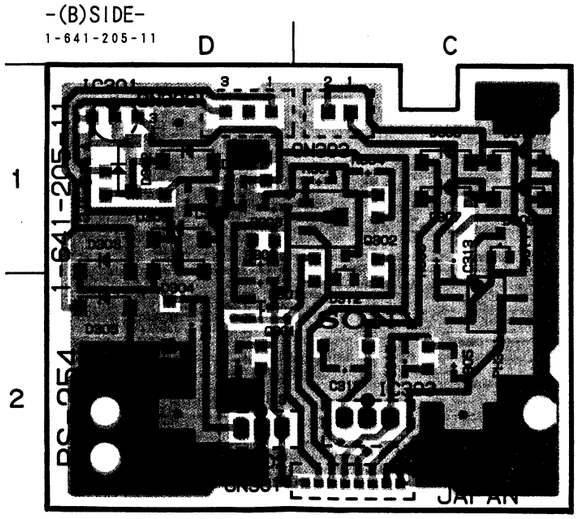
CB-250
-(B)SIDE-
1-641-206-11



IC	
IC203	B-2
IC204	C-3
IC205	E-2
IC206	D-2
IC208	E-3
IC210	G-2
IC211	F-3
IC212	G-1
TRANSISTOR	
Q201	A-3
Q206	A-3
Q207	A-3
DIODE	
D201	A-1
D205	D-2

IC	
IC201	B-1
IC207	E-3
IC209	G-2
IC213	F-3
TRANSISTOR	
Q202	A-3
Q203	B-3
Q204	A-2
Q205	B-3
DIODE	
D202	A-1
D203	A-1
D204	F-1
D206	A-2
D207	B-3
VARIABLE RESISTOR	
RV201	B-3
RV202	D-1
RV203	F-1
RV205	F-2
RV206	D-1
OTHERS	
S201	A-3

PS-254
-(B)SIDE-
1-641-205-11



TRANSISTOR	
Q301	D-2
Q302	C-1
DIODE	
D301	D-1
D302	D-1
D303	D-1
D304	D-1
D305	D-2
D306	D-1
D307	C-1
D308	C-1
D309	C-1
D310	C-1
D311	C-1
D312	C-2
OTHERS	
PH301	C-2

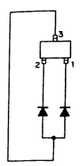
5-4. SEMICONDUCTOR PIN ASSIGNMENTS

The circuit diagram of each IC is obtained from the IC data book published by the manufacturer.

TYPE	PAGE
IC	
AN79L09	5-14
CXA1310AQ	5-14
CXD1156Q	5-15
CXD1159Q	5-18
CXD1250M	5-19
ICX026BLA-A	5-19
ICX027BLA-A	5-19
SC7S00F	5-19
SN74HC193NS	5-19
TC5081AP	5-19
TC74HC132AF	5-20
TC74HC138AF	5-20
TC74HC14AF	5-20
TC74HC74AF	5-20
UPC24M05HF	5-20
UPC319G2	5-20
UPC78N15H	5-20

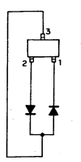
TYPE	PAGE
Tr, DI	
1S2835	5-14
1S2836	5-14
1SS123	5-14
1SS193	5-14
1SS220	5-14
1SS226	5-14
1T33C	5-14
2SA1610	5-14
2SA1611	5-14
2SC1623	5-14
2SC3617	5-14
2SC4176	5-14
2SC4177	5-14
2SK300	5-14
D1FS4	5-14
MA110	5-14
NJL5151MB	5-14

(SCALE 4/1) TOP VIEW



1S2835
1S2836

(SCALE 4/1) TOP VIEW



1SS123
1SS226

(SCALE 4/1) TOP VIEW

1SS193
1SS220

1T33C

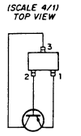
(SCALE 2/1) TOP VIEW

D1FS4

(SCALE 6/1) TOP VIEW

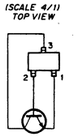
MA110

(SCALE 4/1) TOP VIEW



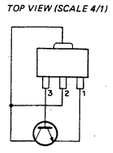
2SA1610
2SA1611

(SCALE 4/1) TOP VIEW



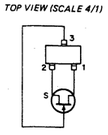
2SC1623
2SC4176
2SC4177

TOP VIEW (SCALE 4/1)



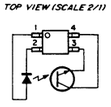
2SC3617

TOP VIEW (SCALE 4/1)



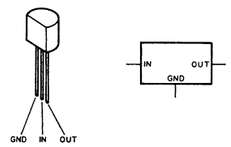
2SK300

TOP VIEW (SCALE 2/1)



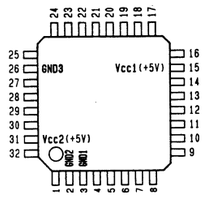
NJL5151MB

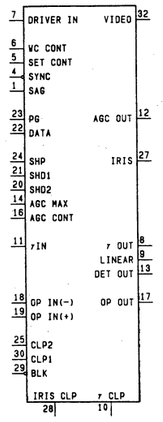
AN79L09 (MATSUSHITA) – 9V
NEGATIVE VOLTAGE REGULATOR (100mA)



CXA1310AQ (SONY)

1-CHIP PROCESS FOR CCD BLACK AND WHITE
– TOP VIEW –

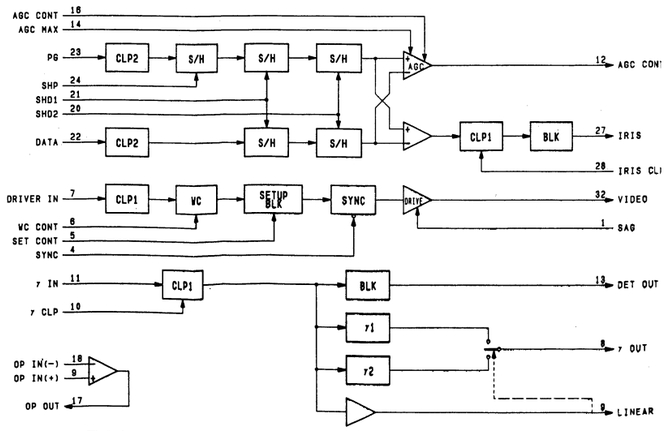




PIN No.	I/O	SIGNAL	PIN No.	I/O	SIGNAL
1	I	SAG	17	O	OP OUT
2	–	GND2	18	I	OP IN (–)
3	–	GND1	19	I	OP IN (+)
4	I	SYNC	20	I	SHD2
5	I	SET CONT	21	I	SHD1
6	I	WC CONT	22	I	DATA
7	I	DRIVER IN	23	I	PG
8	O	γ OUT	24	I	SHP
9	O	LINEAR	25	I	CLP2
10	I	γ CLP	26	–	GND3
11	I	γ IN	27	O	IRIS
12	O	AGC OUT	28	I	IRIS CLP
13	O	DET OUT	29	I	BLK
14	I	AGC MAX	30	I	CLP1
15	–	Vcc1	31	–	Vcc2
16	I	AGC CONT	32	O	VIDEO

INPUT
AGC CONT ; AGC AMPLIFIER GAIN CONTROL
AGC MAX ; AGC AMPLIFIER MAX GAIN
BLK ; BLK PULSE INPUT
CLP1, 2 ; CLP1, 2 PULSE INPUT
DATA ; CCD SIGNAL INPUT
DRIVER IN ; DRIVER INPUT
IRIS CLP ; IRIS OUTPUT CLAMP
OP IN (+) ; OPERATIONAL AMPLIFIER NON-TURX INPUT
OP IN (–) ; OPERATIONAL AMPLIFIER TURN INPUT
PG ; CCD SIGNAL INPUT
SAG ; SAG CORRECTION SIGNAL INPUT
SET CONT ; SETUP LEVEL ADJUSTMENT
SHD1, 2 ; SAMPLE HOLD PULSE INPUT
SHP ; SAMPLE HOLD PULSE INPUT
SYNC ; SYNC PULSE INPUT
WC CONT ; WHITE CLIP LEVEL ADJUSTMENT
γ CLP ; γ INPUT CLAMP
γ IN ; γ ADJUSTMENT INPUT

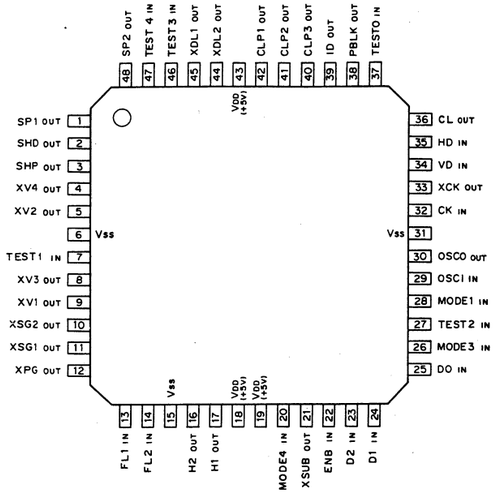
OUTPUT
AGC OUT ; AGC SIGNAL OUTPUT
DET OUT ; AGC DETECTION SIGNAL OUTPUT
IRIS ; IRIS CONTROL SIGNAL OUTPUT
LINEAR ; LINEAR SIGNAL OUTPUT
OP OUT ; OPERATIONAL AMPLIFIER OUTPUT
VIDEO ; VIDEO SIGNAL OUTPUT
γ OUT ; γ CORRECTION SIGNAL OUTPUT



CXD1156Q (SONY) FLAT PACKAGE

C-MOS TIMING GENERATOR FOR CCD IMAGER

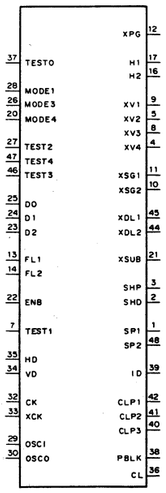
– TOP VIEW –



PARALLEL INPUT MODE (MODE4="H")

INPUTS							SHUTTER SPEED(S)
MODE4	ENB	FL1	FL2	D2	D1	D0	
1	1	1	X	0	0	0	1/60
1	1	1	X	0	0	1	1/125
1	1	1	X	0	1	0	1/250
1	1	1	X	0	1	1	1/500
1	1	1	X	1	0	0	1/1000
1	1	1	X	1	0	1	1/2000
1	1	1	X	1	1	0	1/4000
1	1	1	X	1	1	1	1/10000
X	1	0	1	X	X	X	1/100
X	1	0	0	X	X	X	1/120
X	0	X	X	X	X	X	NORMAL

1 ; HIGH LEVEL
0 ; LOW LEVEL
X ; DON'T CARE

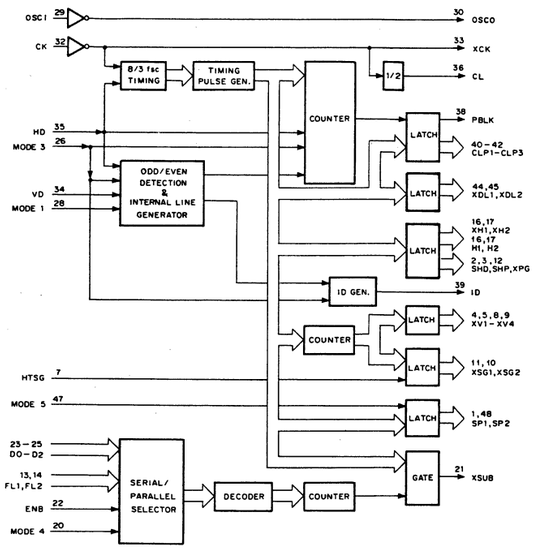


INPUT

CK	; DUTY SYNC GENERATION INPUT
D0 – D2	; SHUTTER SPEED SET
ENB	; ENABLE SIGNAL
FL1, FL2	; MODE SELECT
HD	; HORIZONTAL DRIVE PULSE
MODE1, MODE3, MODE4	; MODE SELECT
OSCI	; OSCILLATING SIGNAL INPUT
TEST0 – TEST4	; GND
VD	; VERTICAL DRIVE PULSE

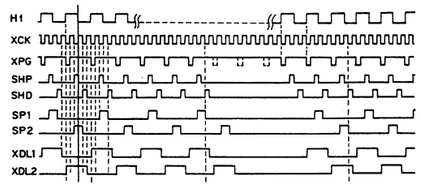
OUTPUT

CL	; 4fsc CLOCK
CLP1 – CLP3	; CLAMP PULSE
H1, H2	; HORIZONTAL SCANNING CLOCK
ID	; LINE DISCRIMINATION PULSE
OSC0	; OSCILLATING SIGNAL OUTPUT
PBLK	; BLANKING CLEANING PULSE
SHD	; DATA SAMPLE HOLD PULSE
SHP	; PRE-CHARGE LEVEL SAMPLE HOLD PULSE
SP1, SP2	; COLOR SEPARATION PULSE
XCK	; DUTY SYNC GENERATION OUTPUT
XDL1, XDL2	; DELAY LINE PULSE
XPG	; PRE-CHARGE GATE PULSE
XSG1, XSG2	; SENSOR ELECTRIC CHARGE READ OUTPUT PULSE
XSUB	; ELECTRIC CHARGE DISCHARGING PULSE
XV1 – XV4	; VERTICAL SCANNING CLOCK

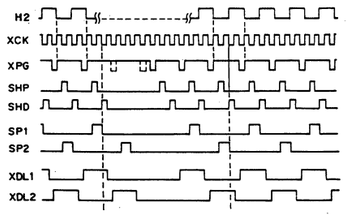


HIGH SPEED SYSTEM TIMING

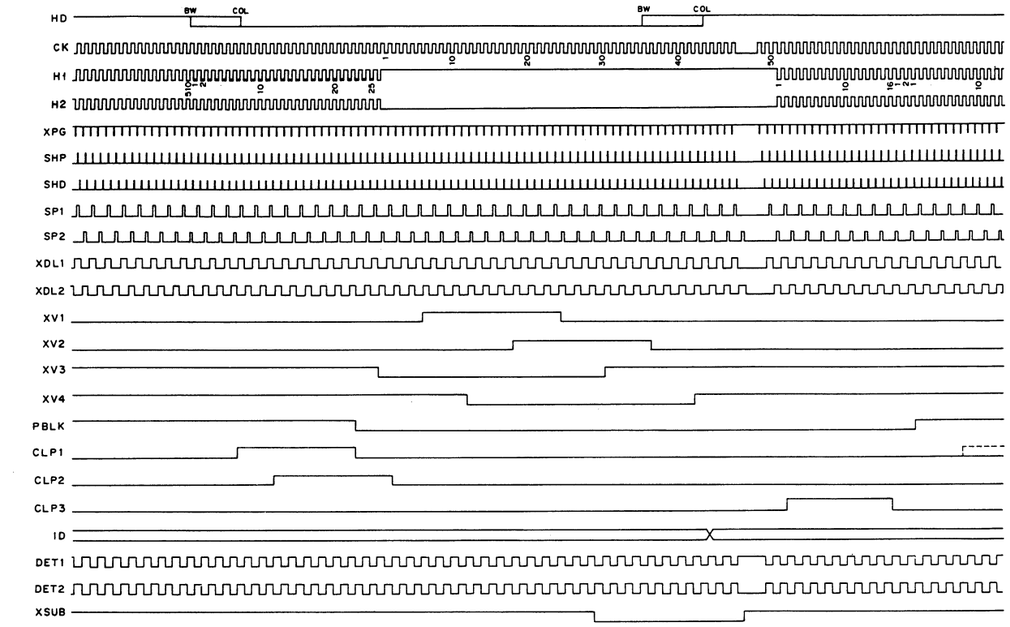
NTSC



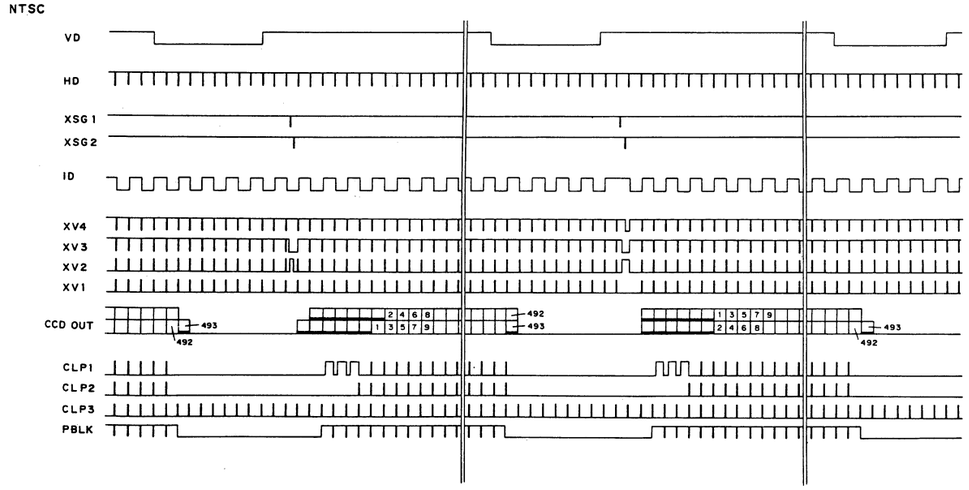
CCIR



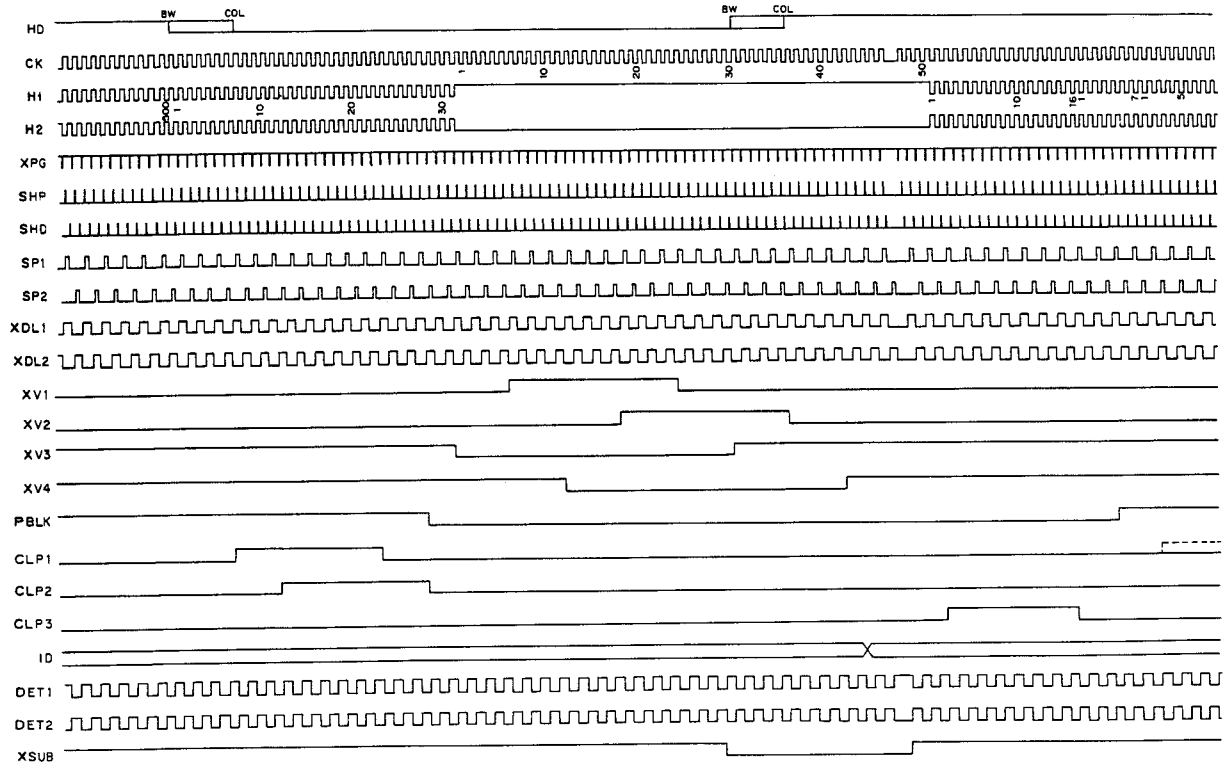
NTSC



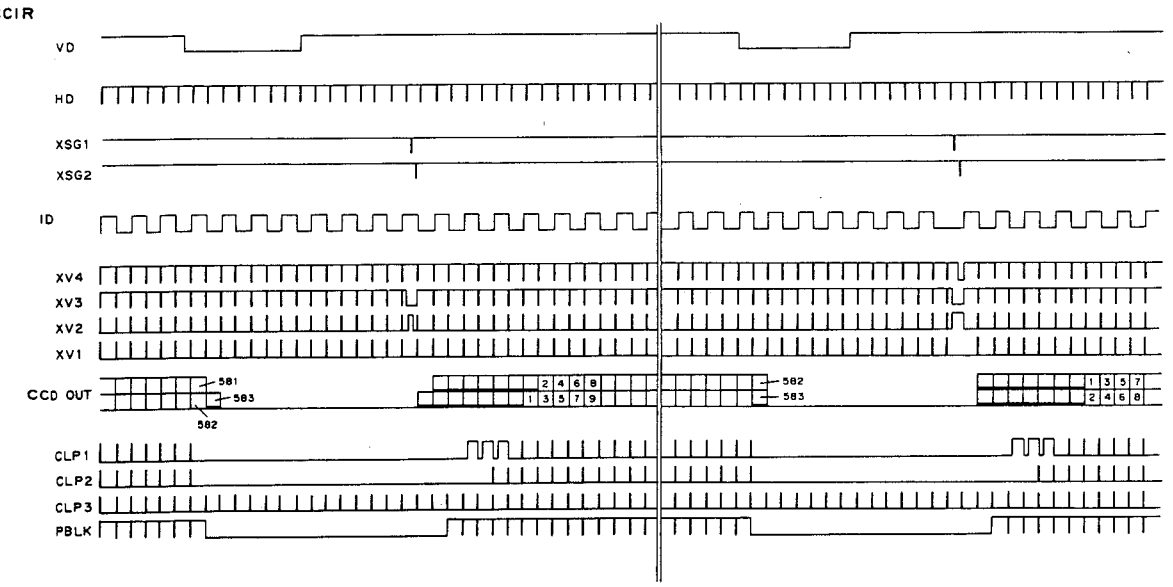
NTSC



CCIR


HD
BW
COL
BW
COL
CK
H1
H2
XPG
SHP
SHD
SP1
SP2
XDL1
XDL2
XV1
XV2
XV3
XV4
PBLK
CLP1
CLP2
CLP3
ID
DET1
DET2
XSUB

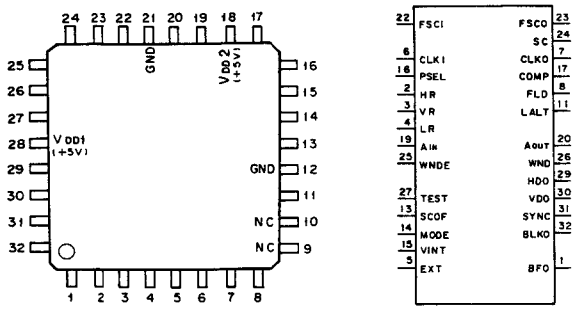
CCIR


VD
HD
XSG1
XSG2
ID
XV4
XV3
XV2
XV1
CCD OUT
581
583
582
582
583
CLP1
CLP2
CLP3
PBLK

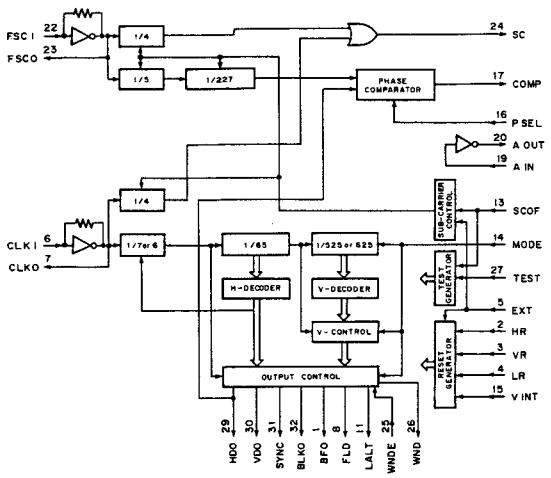
CXD1159Q (SONY)

C-MOS SYNC GENERATOR

– TOP VIEW –



PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL	PIN NO.	I/O	SIGNAL
1	O	BFO	9	–	NC	17	O	COMP	25	I	WNDE
2	I	HR	10	–	NC	18	–	VDD2(+ 5V)	26	O	WND
3	I	VR	11	O	LALT	19	I	AIN	27	I	TEST
4	I	LR	12	–	GND	20	O	AOUT	28	–	VDD1(+ 5V)
5	I	EXT	13	I	SCOF	21	–	GND	29	O	HDO
6	I	CLKI	14	I	MODE	22	I	FSCI	30	O	VDO
7	O	CLKO	15	I	VINT	23	O	FSCO	31	O	SYNC
8	O	FLD	16	I	PSEL	24	O	SC	32	O	BLKO



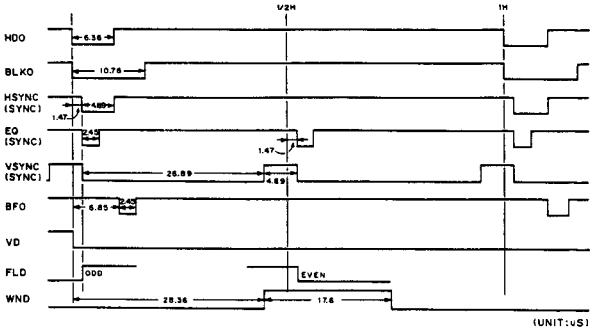
INPUT

AIN	; FILTER INVERTER INPUT
CLKI	; CLOCK INPUT (NTSC ; 14.31818MHz /PAL ; 14.1875MHz)
EXT	; INT/EXT (L ; INT)
FSCI	; 4FSC CLOCK INPUT
HR	; H RESET
LR	; LALT RESET
MODE	; NTSC/PAL (L ; NTSC)
PSEL	; POLARITY SELECT FOR PHASE COMP
SCOF	; SUBCARRIER OFF (L ; OFF)
TEST	; TEST INPUT
VINT	; INITIALIZE
VR	; V RESET
WNDE	; WINDOW ENABLE

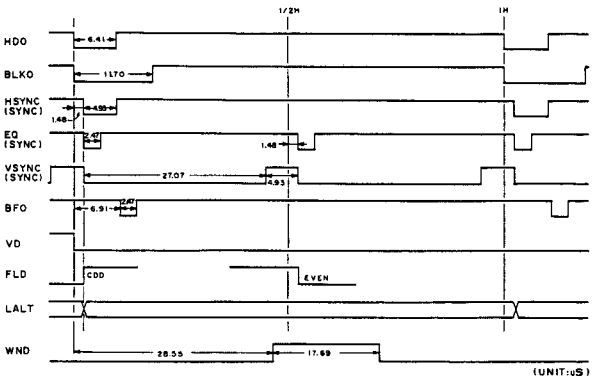
OUTPUT

AOUT	; FILTER INVERTER OUTPUT
BFO	; BURST FLAG PULSE
BLKO	; COMPOSITE BLANKING PULSE
CLKO	; CLOCK OUTPUT
COMP	; PHASE COMP
FLD	; FIELD PULSE
FSCO	; 4FSC CLOCK OUTPUT
HDO	; H DRIVE PULSE
LALT	; LINE ALTERNATE PULSE
SC	; SUBCARRIER
SYNC	; COMPOSITE SYNC PULSE
VDO	; V DRIVE PULSE
WND	; WINDOW

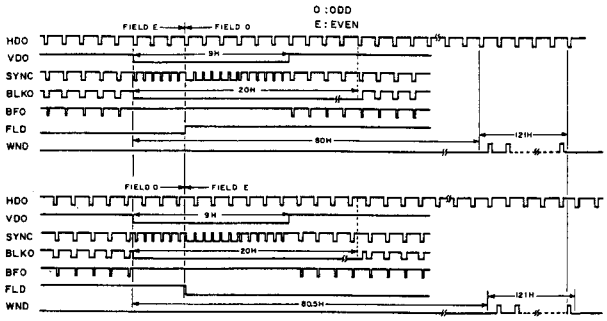
TIMING CHART H (NTSC)



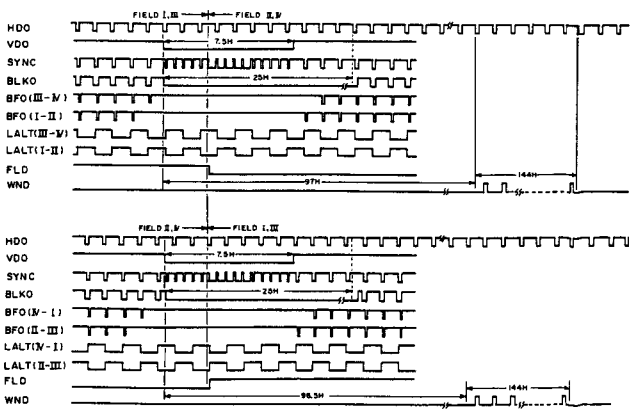
TIMING CHART H (PAL)



TIMING CHART V (NTSC)



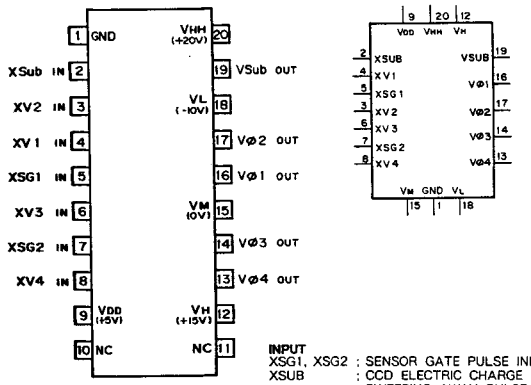
TIMING CHART V (PAL)

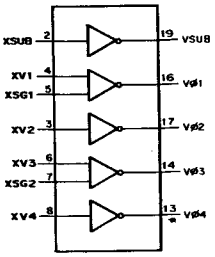


CXD1250M (SONY) FLAT PACKAGE

C-MOS VERTICAL CLOCK DRIVER FOR CCD

– TOP VIEW –





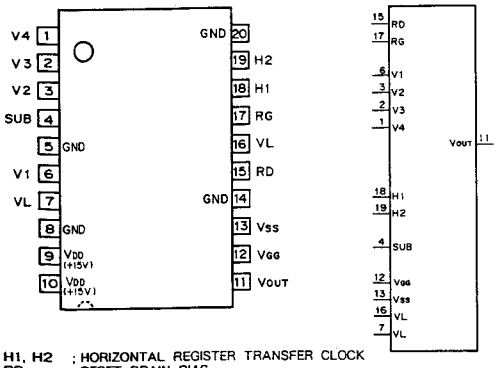
INPUT
XSG1, XSG2 ; SENSOR GATE PULSE INPUT
XSUB ; CCD ELECTRIC CHARGE SWEEPING AWAY PULSE INPUT
XV1-XV4 ; VERTICAL REGISTER TRANSMISSION CLOCK INPUT

OUTPUT
VSUB ; CCD ELECTRIC CHARGE SWEEPING AWAY PULSE OUTPUT
V ϕ 1-V ϕ 4 ; VERTICAL REGISTER TRANSMISSION CLOCK OUTPUT

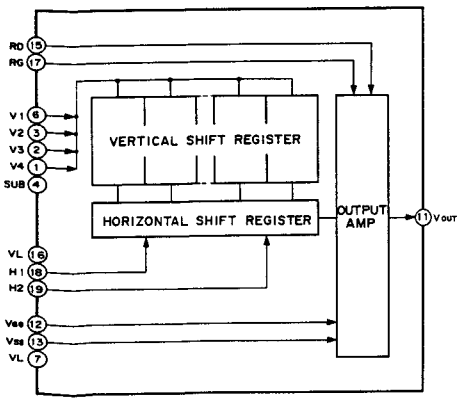
ICX026BLA-A (SONY) (NTSC, MONOCHROME)
ICX027BLA-A (SONY) (PAL, MONOCHROME)

1/2-INCH CCD IMAGE BLOCK

– TOP VIEW –



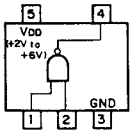
H1, H2 ; HORIZONTAL REGISTER TRANSFER CLOCK
RD ; RESET DRAIN BIAS
RG ; RESET GATE CLOCK
SUB ; OVERFLOW DRAIN
VGG ; OUTPUT AMP GATE BIAS
VL ; PROTECTION TRANSISTOR BIAS
Vss ; OUTPUT AMP SOURCE
V1 – V4 ; VERTICAL REGISTER TRANSFER CLOCK
VOUT ; SIGNAL OUTPUT

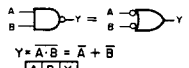


SC7S00F (MOTOROLA) FLAT PACKAGE

C-MOS 2-INPUT NAND GATE

– TOP VIEW –





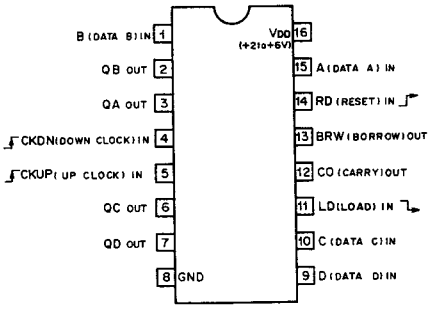
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

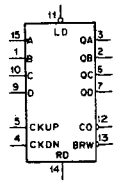
0 ; LOW LEVEL
1 ; HIGH LEVEL

SN74HC193NS (TI) FLAT PACKAGE

C-MOS PRESETTABLE SYNCHRONOUS 4-BIT UP/DOWN COUNTER

– TOP VIEW –

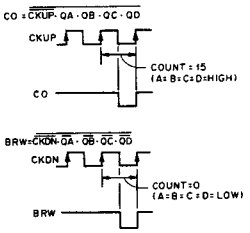

B (DATA B) IN 1
QB OUT 2
QA OUT 3
CKDN (DOWN CLOCK) IN 4
CKUP (UP CLOCK) IN 5
QC OUT 6
QD OUT 7
8 GND
VDD (+2 to +6V) 16
15 A (DATA A) IN
14 RD (RESET) IN
13 BRW (BORROW) OUT
12 CO (CARRY) OUT
11 LD (LOAD) IN
10 C (DATA C) IN
9 D (DATA D) IN



CONTROL INPUT				MODE
RD	LD	CKUP	CKDN	
1	X	X	X	RESET TO ZERO
0	0	X	X	PRESET
0	1	↑	1	UP COUNT
0	1	1	↑	DOWN COUNT
0	1	1	1	NO COUNT

COUNT	OUTPUT			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

UP COUNT
DOWN COUNT

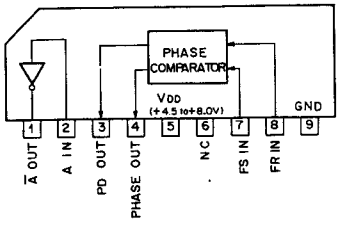


0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

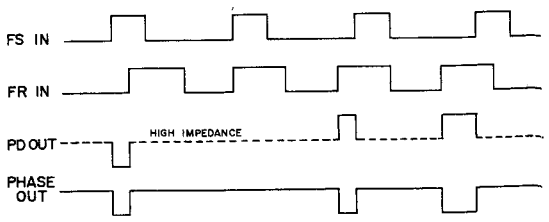
TC5081AP (TOSHIBA)

C-MOS PHASE COMPARATOR

– SIDE VIEW –



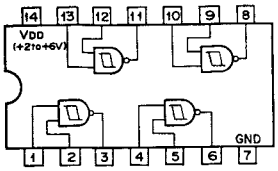
PHASE COMPARATOR TIMING CHART

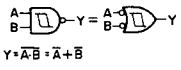


TC74HC132AF (TOSHIBA) FLAT PACKAGE

C-MOS 2-INPUT NAND SCHMITT TRIGGER

– TOP VIEW –





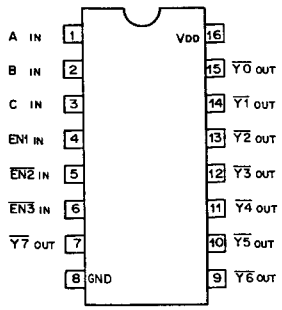
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

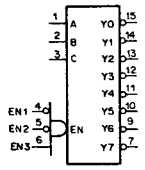
0 ; LOW LEVEL
1 ; HIGH LEVEL

TC74HC138AF (TOSHIBA) FLAT PACKAGE

C-MOS 3-TO-8 LINE DECODER/DEMULTIPLEXER

– TOP VIEW –





INPUTS				OUTPUTS							
EN	C	B	A	Y7	Y6	Y5	Y4	Y3	Y2	Y1	Y0
0	X	X	X	1	1	1	1	1	1	1	1
1	0	0	0	1	1	1	1	1	1	1	0
1	0	0	1	1	1	1	1	1	1	0	1
1	0	1	0	1	1	1	1	1	0	1	1
1	0	1	1	1	1	1	1	0	1	1	1
1	1	0	0	1	1	1	0	1	1	1	1
1	1	0	1	1	1	0	1	1	1	1	1
1	1	1	0	1	0	1	1	1	1	1	1
1	1	1	1	0	1	1	1	1	1	1	1

EN = $\overline{EN1} \cdot \overline{EN2} \cdot EN3$

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

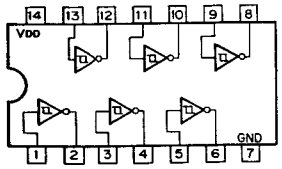
NOTE :

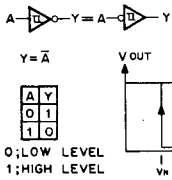
TYPE	VDD
74HCT138 TYPE	+5V
74ACT138 TYPE	+4.5 to +5.5V
TC74AC138 TYPE	+2 to +5.5V
OTHER TYPES	+2 to +6V

TC74HC14AF (TOSHIBA) FLAT PACKAGE

C-MOS HEX SCHMITT TRIGGER INVERTERS

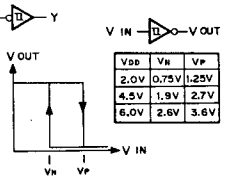
– TOP VIEW –





A	Y
0	1
1	0

0 ; LOW LEVEL
1 ; HIGH LEVEL



VDD	VN	VP
2.0V	0.75V	1.25V
4.5V	1.9V	2.7V
6.0V	2.6V	3.6V

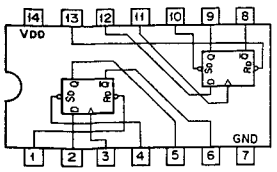
NOTE :

TYPE	VDD
TC74AC14 TYPE	+2 to +5.5V
OTHER TYPES	+2 to +6V

TC74HC74AF (TOSHIBA) FLAT PACKAGE

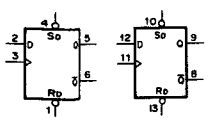
C-MOS DUAL D-TYPE FLIP-FLOPS WITH DIRECT SET/RESET

– TOP VIEW –



INPUTS				OUTPUTS	
$\overline{S_D}$	$\overline{R_D}$	CK	D	Qn+1	$\overline{Q_{n+1}}$
0	1	X	X	1	0
1	0	X	X	0	1
0	0	X	X	1	1
1	1	↑	1	1	0
1	1	↑	0	0	1
1	1	0	X	Qn	$\overline{Q_n}$

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE



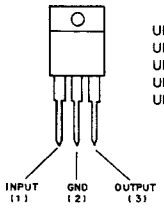
NOTE :

TYPE	VDD
TC74HCT74AF	+5V
TC74AC74 TYPE	+2 to +5.5V
74ACT74 TYPE	+4.5 to +5.5V
OTHER TYPES	+2 to +6V

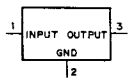
UPC24M05HF (NEC)

POSITIVE VOLTAGE REGULATOR

– FRONT VIEW –



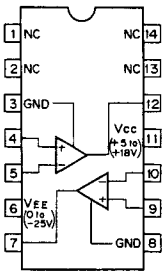
UPC2408HF ; + 8V (2.2A)
UPC2412HF ; + 12V (2.2A)
UPC24M05HF ; + 5V (0.5A)
UPC24M09HF ; + 9V (0.5A)
UPC24M12HF ; + 12V (0.5A)



UPC319G2 (NEC) FLAT PACKAGE

DUAL VOLTAGE COMPARATOR

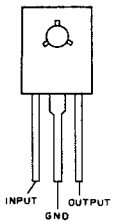
– TOP VIEW –

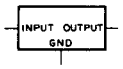


UPC78N15H (NEC) + 15V

POSITIVE VOLTAGE REGULATOR

– FRONT VIEW –





SECTION 6
REPAIR PARTS

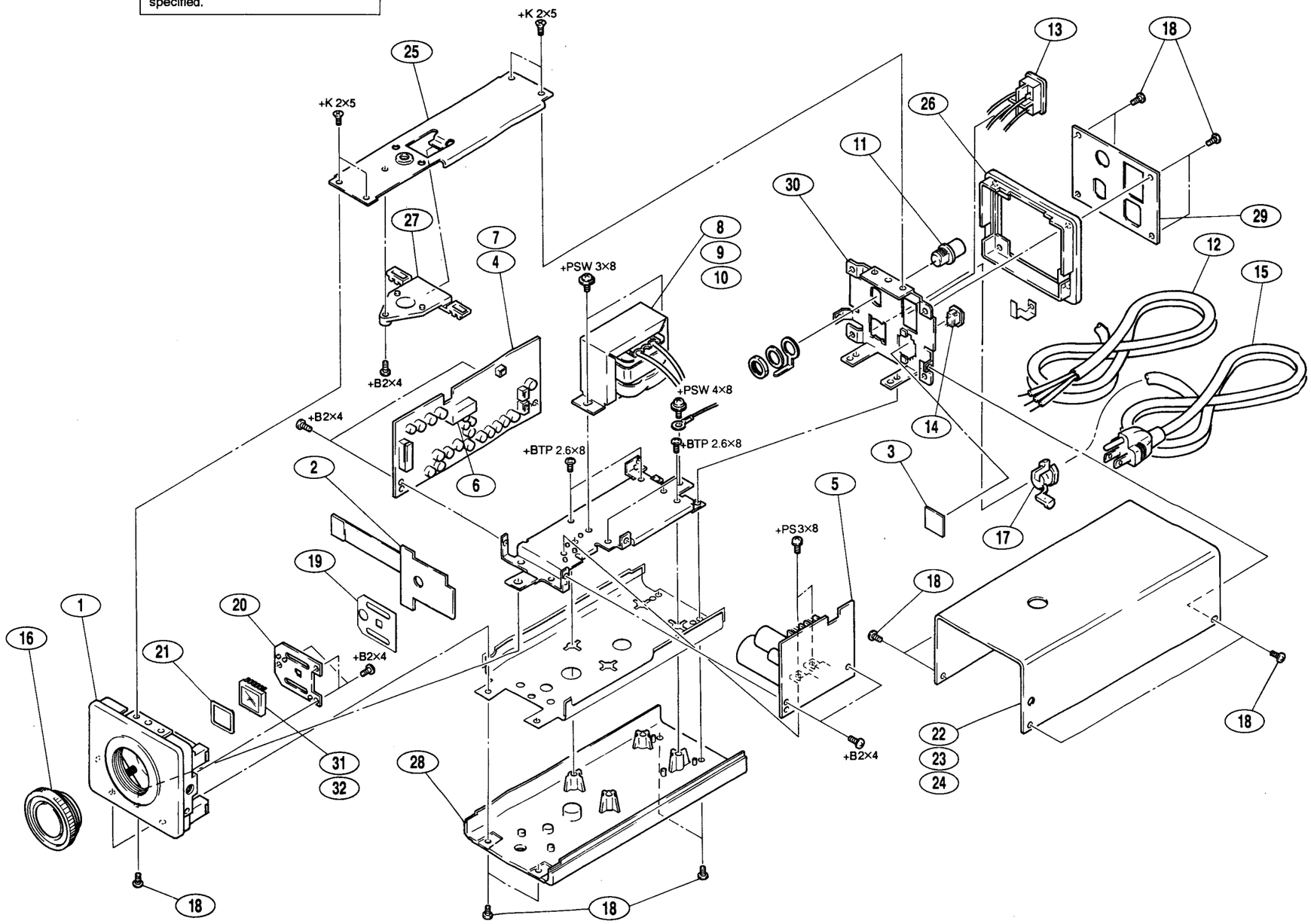
[NOTE]

- Items with no part number and no description are not stocked because they are seldom required for routine service.
- All resistors are in ohms.
- items marked "o" in the SP column are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

6-1. EXPLODED VIEWS AND PARTS LIST

No.	Part No.	SP	Description
1	A-7424-022-A	o	PANEL ASSY, FRONT
2	A-7520-574-A	o	MOUNTED CIRCUIT BOARD, BI-254
3	A-7520-575-A	o	MOUNTED CIRCUIT BOARD, CB-250
4	A-7520-577-A	o	MOUNTED CIRCUIT BOARD, MB-254 (for SSC-M256)
5	A-7520-578-A	o	MOUNTED CIRCUIT BOARD, PS-254
6	A-7520-579-A	o	MOUNTED CIRCUIT BOARD, LC-254
7	A-7520-580-A	o	MOUNTED CIRCUIT BOARD, MB-254 (for SSC-M257CE/259CE)
8	⚠ 1-450-710-11	s	TRANSFORMER, POWER (for SSC-M257CE)
9	⚠ 1-450-711-11	s	TRANSFORMER, POWER (for SSC-M256)
10	⚠ 1-450-712-11	s	TRANSFORMER, POWER (for SSC-M259CE)
11	1-509-891-00	s	CONNECTOR, BNC
12	⚠ 1-551-044-41	s	CORD, POWER (for SSC-M257CE/259CE)
13	⚠ 1-570-455-21	s	SWITCH, ROCKER (AC POWER)
14	1-580-172-11	s	CONNECTOR, MICRO (RECEPTACLE) 4P
15	⚠ 1-690-374-11	s	CORD, AC (3P) (for SSC-M256)
16	2-042-385-00	s	CAP, C MOUNT
17	⚠ 2-045-063-00	s	STOPPER, CORD
18	3-172-750-01	s	SCREW (M2X5)
19	3-173-157-01	o	INSULATOR, CCD
20	3-173-158-01	o	RETAINER, CCD
21	3-173-159-01	s	RUBBER, SEAL
22	3-173-160-21	o	CASE, UPPER (for SSC-M256)
23	3-173-160-31	o	CASE, UPPER (for SSC-M257CE)
24	3-173-160-41	o	CASE, UPPER (for SSC-M259CE)
25	3-173-161-01	o	STAY
26	3-173-162-01	o	CASE, REAR
27	3-173-166-01	o	HOLDER, PC BOARD
28	3-173-168-01	o	CASE, LOWER
29	3-173-169-01	o	COVER (B), REAR
30	3-173-170-01	o	FRAME (B), REAR
31	8-752-607-69	s	IC ICX026BLA-A (for SSC-M256)
32	8-752-607-79	s	IC ICX027BLA-A (for SSC-M257CE/259CE)
	7-621-555-39	s	SCREW +K 2X5
	7-621-772-18	s	SCREW +B 2X4
	7-682-648-09	s	SCREW +PS 3X8
	7-682-661-09	s	SCREW +PSW 4X8
	7-682-948-01	s	SCREW +PSW 3X8
	7-685-534-14	s	SCREW +BTP 2.6X8 TYPE2 N-S



SSC-M256(UC)
SSC-M257CE(AE)
SSC-M259CE(UK)

6-2. ELECTRICAL PARTS LIST

BI-254 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-574-A	o	MOUNTED CIRCUIT BOARD, BI-254 (not containing IC101)
C101	1-164-156-11	s	CERAMIC 0.1uF 25V
C102	1-135-154-21	s	TANTAL 3.3uF 20% 20V
C103	1-135-145-11	s	TANTALUM, CHIP 0.47uF 10% 35V
C104	1-164-156-11	s	CERAMIC 0.1uF 25V
C105	1-126-397-11	s	ELECT, CHIP 33uF 20% 25V
C106	1-135-177-21	s	TANTAL 1uF 10% 20V
C107	1-126-399-11	s	ELECT, CHIP 10uF 20% 35V
C108	1-164-156-11	s	CERAMIC 0.1uF 25V
C109	1-135-177-21	s	TANTAL 1uF 10% 20V
C110	1-126-403-11	s	ELECT 3.3uF 20% 50V
C111	1-164-156-11	s	CERAMIC 0.1uF 25V
C112	1-164-156-11	s	CERAMIC 0.1uF 25V
CN101	1-949-246-11	o	HARNESS (CONNECTOR ASSY 2P)
IC101	8-752-607-69	s	IC ICX026BLA-A (for SSC-M257CE/259CE)
	8-752-607-79	s	IC ICX027BLA-A (for SSC-M256)
Q101	8-765-420-02	s	TRANSISTOR 2SK300-3
Q102	8-729-140-63	s	TRANSISTOR 2SA1611-M5M6
R101	1-216-831-11	s	METAL, CHIP 6.8K 5% 1/16W
R102	1-216-838-11	s	METAL, CHIP 27K 5% 1/16W
R103	1-216-837-11	s	METAL, CHIP 22K 5% 1/16W
R104	1-216-848-11	s	METAL, CHIP 180K 5% 1/16W
R106	1-216-809-11	s	METAL, CHIP 100 5% 1/16W
R107	1-216-828-11	s	METAL, CHIP 3.9K 5% 1/16W
R108	1-216-844-11	s	METAL, CHIP 82K 5% 1/16W
R110	1-216-857-11	s	METAL, CHIP 1M 5% 1/16W
R111	1-218-289-11	s	METAL 510 5% 1/16W
W101	1-690-326-11	o	CABLE, FLAT (1.0M/M PITCH) 12P

CB-250 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-575-A	o	MOUNTED CIRCUIT BOARD, CB-250
C401	1-163-117-00	s	CERAMIC, CHIP 100PF 5% 50V
C402	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
CN402	1-949-249-11	o	HARNESS (CONNECTOR ASSY 3P)
R401	1-216-295-00	s	METAL, CHIP 0-OHM

LC-254 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-579-A	o	MOUNTED CIRCUIT BOARD, LC-254
C801	1-162-921-11	s	CERAMIC, CHIP 33PF 5% 50V
C802	1-162-919-11	s	CERAMIC, CHIP 22PF 5% 50V
C804	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C805	1-135-181-21	s	TANTAL 4.7uF 10% 6.3V
CN801	1-564-317-11	o	PIN, BOARD TO BOARD 5P
CT801	1-141-311-11	s	CAP, TRIMMER 20PF
D801	8-713-300-88	s	DIODE 1T33C-01
IC801	8-759-038-46	s	IC SC7S00F
L801	1-410-373-31	s	INDUCTOR CHIP 2.2uH
L802	1-412-030-11	s	INDUCTOR CHIP 22uH
R801	1-216-857-11	s	METAL, CHIP 1M 5% 1/16W
R802	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W

MB-254 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-577-A	o	MOUNTED CIRCUIT BOARD, MB-254 (N) (for SSC-M256)
1pc	A-7520-580-A	o	MOUNTED CIRCUIT BOARD, MB-254 (C) (for SSC-M257CE/259CE)
C201	1-164-156-11	s	CERAMIC 0.1uF 25V
C202	1-126-397-11	s	ELECT, CHIP 33uF 20% 25V
C203	1-164-156-11	s	CERAMIC 0.1uF 25V
C204	1-126-396-11	s	ELECT, CHIP 47uF 20% 16V
C205	1-164-156-11	s	CERAMIC 0.1uF 25V
C206	1-126-400-11	s	ELECT, CHIP 22uF 20% 35V
C207	1-164-156-11	s	CERAMIC 0.1uF 25V
C208	1-126-400-11	s	ELECT, CHIP 22uF 20% 35V
C209	1-126-397-11	s	ELECT, CHIP 33uF 20% 25V
C210	1-164-156-11	s	CERAMIC 0.1uF 25V
C211	1-162-917-11	s	CERAMIC, CHIP 15PF 5% 50V
C212	1-162-915-11	s	CERAMIC, CHIP 10PF 5PF 50V
C213	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C214	1-164-156-11	s	CERAMIC 0.1uF 25V
C215	1-162-923-11	s	CERAMIC, CHIP 47PF 5% 50V
C216	1-162-923-11	s	CERAMIC, CHIP 47PF 5% 50V
C217	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C218	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C220	1-164-156-11	s	CERAMIC 0.1uF 25V
C222	1-162-958-11	s	CERAMIC 270PF 5% 50V
C223	1-162-925-11	s	CERAMIC, CHIP 68PF 5% 50V
C224	1-162-923-11	s	CERAMIC, CHIP 47PF 5% 50V
C225	1-162-923-11	s	CERAMIC, CHIP 47PF 5% 50V
C226	1-164-156-11	s	CERAMIC 0.1uF 25V
C228	1-164-156-11	s	CERAMIC 0.1uF 25V
C229	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C230	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C231	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C232	1-164-156-11	s	CERAMIC 0.1uF 25V
C233	1-164-156-11	s	CERAMIC 0.1uF 25V
C234	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C235	1-135-155-21	s	TANTAL CHIP 4.7uF 10% 16V
C236	1-135-155-21	s	TANTAL CHIP 4.7uF 10% 16V
C237	1-135-149-21	s	TANTALUM, CHIP 2.2uF 10% 10V
C238	1-135-149-21	s	TANTALUM, CHIP 2.2uF 10% 10V
C239	1-135-161-21	s	TANTALUM, CHIP 22uF 10% 10V
C242	1-135-177-21	s	TANTAL 1uF 10% 20V
C243	1-164-156-11	s	CERAMIC 0.1uF 25V
C244	1-126-394-11	s	ELECT, CHIP 10uF 20% 16V
C245	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C246	1-164-156-11	s	CERAMIC 0.1uF 25V
C247	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C248	1-164-156-11	s	CERAMIC 0.1uF 25V
C249	1-126-394-11	s	ELECT, CHIP 10uF 20% 16V
C250	1-164-156-11	s	CERAMIC 0.1uF 25V
C251	1-126-398-11	s	ELECT, CHIP 4.7uF 20% 35V
C252	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C253	1-162-964-11	s	CERAMIC 0.001uF 10% 50V
C254	1-137-306-11	s	FILM 0.1uF 5% 16V
C255	1-164-156-11	s	CERAMIC 0.1uF 25V
C256	1-164-156-11	s	CERAMIC 0.1uF 25V
C257	1-162-964-11	s	CERAMIC 0.001uF 10% 50V
C258	1-162-964-11	s	CERAMIC 0.001uF 10% 50V
C259	1-164-156-11	s	CERAMIC 0.1uF 25V
C260	1-164-156-11	s	CERAMIC 0.1uF 25V

(MB-254 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
C261	1-126-394-11	s	ELECT, CHIP 10uF 20% 16V
C262	1-164-156-11	s	CERAMIC 0.1uF 25V
C263	1-126-401-11	s	ELECT, CHIP 1uF 20% 50V
C264	1-126-398-11	s	ELECT, CHIP 4.7uF 20% 35V
C265	1-126-394-11	s	ELECT, CHIP 10uF 20% 16V
C266	1-126-398-11	s	ELECT, CHIP 4.7uF 20% 35V
C267	1-126-394-11	s	ELECT, CHIP 10uF 20% 16V
C271	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C273	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C274	1-164-156-11	s	CERAMIC 0.1uF 25V
C275	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C276	1-126-392-11	s	ELECT, CHIP 100uF 20% 6.3V
C277	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C278	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C279	1-162-970-11	s	CERAMIC, CHIP 0.01uF 10% 25V
C280	1-162-919-11	s	CERAMIC, CHIP 22PF 5% 50V
C281	1-164-218-11	s	CERAMIC 180PF 0.25PF 50V
CN201	1-573-985-31	o	CONNECTOR, FPC/FFC 12P
CN202	1-566-757-11	s	PIN, CONNECTOR (PC BOARD) 2P
CN204	1-566-757-11	s	PIN, CONNECTOR (PC BOARD) 2P
CN205	1-566-758-11	o	PIN, CONNECTOR (PC BOARD) 3P
CN206	1-566-763-11	o	PIN, CONNECTOR (PC BOARD) 8P
D201	8-719-104-34	s	DIODE 1S2836
D202	8-719-801-48	s	DIODE 1SS193
D203	8-719-800-76	s	DIODE 1SS226
D204	8-719-800-76	s	DIODE 1SS226
D205	8-719-801-48	s	DIODE 1SS193
D206	8-719-404-46	s	DIODE MA110
D207	8-719-404-46	s	DIODE MA110
FL201	1-239-185-21	s	FILTER, LOW PASS
IC201	8-752-327-46	s	IC CXD1250M
IC203	8-752-333-91	s	IC CXD1156Q
IC204	8-752-326-08	s	IC CXD1159Q
IC205	8-752-053-66	s	IC CXA1310AQ
IC206	8-759-250-81	s	IC TC5081AP
IC207	8-759-235-97	s	IC TC74HC132AF
IC208	8-759-105-49	s	IC UPC319G2
IC209	8-759-235-97	s	IC TC74HC132AF
IC210	8-759-232-32	s	IC TC74HC74AF
IC211	8-759-926-37	s	IC SN74HC193ANS
IC212	8-759-232-16	s	IC TC74HC14AF
IC213	8-759-236-09	s	IC TC74HC138AF
L201	1-410-196-11	s	INDUCTOR CHIP 2.2uH
L202	1-410-196-11	s	INDUCTOR CHIP 2.2uH
L203	1-410-196-11	s	INDUCTOR CHIP 2.2uH
L204	1-410-196-11	s	INDUCTOR CHIP 2.2uH
Q201	8-729-117-32	s	TRANSISTOR 2SC4177
Q202	8-729-117-32	s	TRANSISTOR 2SC4177
Q203	8-729-117-32	s	TRANSISTOR 2SC4177
Q204	8-729-143-07	s	TRANSISTOR 2SA1610-Y33
Q205	8-729-143-17	s	TRANSISTOR 2SC4176-B33
Q206	8-729-143-17	s	TRANSISTOR 2SC4176-B33
Q207	8-729-143-07	s	TRANSISTOR 2SA1610-Y33
R201	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R202	1-216-835-11	s	METAL, CHIP 15K 5% 1/16W
R203	1-216-840-11	s	METAL, CHIP 39K 5% 1/16W

SSC-M256(UC)
SSC-M257CE(AE)
SSC-M259CE(UK)

(MB-254 BOARD)

Ref. No. or Q'ty	Part No.	SP	Description
R204	1-216-850-11	s	METAL 270K 5% 1/16W
R205	1-216-842-11	s	METAL, CHIP 56K 5% 1/16W
R206	1-216-838-11	s	METAL, CHIP 27K 5% 1/16W
R207	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R208	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R209	1-216-857-11	s	METAL, CHIP 1M 5% 1/16W
R210	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R211	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R212	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R213	1-216-828-11	s	METAL, CHIP 3.9K 5% 1/16W
R214	1-216-825-11	s	METAL, CHIP 2.2K 5% 1/16W
R215	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R216	1-216-857-11	s	METAL, CHIP 1M 5% 1/16W
R217	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R218	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R219	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R220	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R221	1-218-285-11	s	METAL, CHIP 75 5% 1/16W
R222	1-216-799-11	s	METAL 15 5% 1/16W
R224	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R225	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R226	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R227	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R228	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R229	1-216-833-11	s	METAL, CHIP 10K 5% 1/16W
R230	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R233	1-216-830-11	s	METAL, CHIP 5.6K 5% 1/16W
R234	1-216-830-11	s	METAL, CHIP 5.6K 5% 1/16W
R236	1-216-864-11	s	METAL, CHIP 0-OHM (for SSC-M256)
R237	1-216-864-11	s	METAL, CHIP 0-OHM
R238	1-216-864-11	s	METAL, CHIP 0-OHM (for SSC-M256)
R239	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R240	1-216-821-11	s	METAL, CHIP 1K 5% 1/16W
R241	1-216-828-11	s	METAL, CHIP 3.9K 5% 1/16W
R242	1-216-817-11	s	METAL, CHIP 470 5% 1/16W
R243	1-216-817-11	s	METAL, CHIP 470 5% 1/16W
R244	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R245	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R246	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R247	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R248	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
R249	1-216-841-11	s	METAL, CHIP 47K 5% 1/16W
R250	1-216-864-11	s	METAL, CHIP 0-OHM (for SSC-M257CE/259CE)
R251	1-216-864-11	s	METAL, CHIP 0-OHM (for SSC-M257CE/259CE)
R252	1-216-864-11	s	METAL, CHIP 0-OHM
R253	1-216-809-11	s	METAL, CHIP 100 5% 1/16W
R254	1-216-809-11	s	METAL, CHIP 100 5% 1/16W
R255	1-216-857-11	s	METAL, CHIP 1M 5% 1/16W
R256	1-216-845-11	s	METAL, CHIP 100K 5% 1/16W
RV201	1-238-092-11	s	RES, ADJ CERMET 47K
RV202	1-238-087-11	s	RES, ADJ CERMET 1K
RV203	1-238-092-11	s	RES, ADJ CERMET 47K
RV205	1-238-092-11	s	RES, ADJ CERMET 47K
RV206	1-238-094-11	s	RES, ADJ CERMET 220K
S201	1-571-275-31	s	SWITCH, SLIDE

PS-254 BOARD

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7520-578-A	o	MOUNTED CIRCUIT BOARD, PS-254 (not containing IC302 and IC303)
C301	1-126-101-11	s	ELECT 100uF 20% 16V
C302	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C303	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C304	1-126-104-11	s	ELECT 470uF 20% 35V
C305	1-124-478-11	s	ELECT 100uF 20% 25V
C306	1-124-478-11	s	ELECT 100uF 20% 25V
C307	1-124-478-11	s	ELECT 100uF 20% 25V
C308	1-124-478-11	s	ELECT 100uF 20% 25V
C309	1-124-478-11	s	ELECT 100uF 20% 25V
C310	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C311	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C312	1-126-105-11	s	ELECT 1000 20% 35V
C313	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C314	1-124-442-00	s	ELECT 330uF 20% 6.3V
C315	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C316	1-163-038-00	s	CERAMIC, CHIP 0.1uF 25V
C317	1-126-103-11	s	ELECT 470uF 20% 16V
C318	1-124-910-11	s	ELECT 47uF 20% 50V
CN301	1-949-247-11	o	HARNESS (CONNECTOR ASSY 8P)
CN302	1-564-506-11	o	PLUG, CONNECTOR 3P
CN303	1-564-505-11	o	PLUG, CONNECTOR 2P
D301	8-719-510-11	s	DIODE D1FS4
D302	8-719-510-11	s	DIODE D1FS4
D303	8-719-510-11	s	DIODE D1FS4
D304	8-719-510-11	s	DIODE D1FS4
D305	8-719-510-11	s	DIODE D1FS4
D306	8-719-510-11	s	DIODE D1FS4
D307	8-719-510-11	s	DIODE D1FS4
D308	8-719-510-11	s	DIODE D1FS4
D309	8-719-510-11	s	DIODE D1FS4
D310	8-719-510-11	s	DIODE D1FS4
D311	8-719-801-48	s	DIODE 1SS193
D312	8-719-801-48	s	DIODE 1SS193
IC301	8-759-400-22	s	IC AN79L09
IC302	8-759-112-10	s	IC UPC78N15H
IC303	8-759-144-84	s	IC UPC24M05HF
PH301	8-719-710-04	s	PHOTO COUPLER NJL5151M
Q301	8-729-100-66	s	TRANSISTOR 2SC1623
Q302	8-729-144-56	s	TRANSISTOR 2SC3617
R301	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R302	1-216-091-00	s	METAL, CHIP 56K 5% 1/10W
R303	1-216-059-00	s	METAL, CHIP 2.7K 5% 1/10W
R304	1-216-067-00	s	METAL, CHIP 5.6K 5% 1/10W
R305	1-216-073-00	s	METAL, CHIP 10K 5% 1/10W
R306	1-216-049-00	s	METAL, CHIP 1K 5% 1/10W
R307	1-216-033-00	s	METAL, CHIP 220 5% 1/10W

FRAME

Ref. No. or Q'ty	Part No.	SP	Description
1pc	⚠ 1-450-710-11	s	TRANSFORMER, POWER (for SSC-M257CE)
1pc	⚠ 1-450-711-11	s	TRANSFORMER, POWER (for SSC-M256)
1pc	⚠ 1-450-712-11	s	TRANSFORMER, POWER (for SSC-M259CE)
1pc	⚠ 1-551-044-41	s	CORD, POWER (for SSC-M257CE/259CE)
1pc	⚠ 1-570-455-41	s	SWITCH, ROCKER (AC POWER)
1pc	⚠ 1-690-374-11	s	CORD, AC (3P) (for SSC-M256)
CN204F (to MB-254 BOARD)			
	1-949-248-11	o	HARNESS (CONNECTOR ASSY 2P)
CN502	1-509-891-00	s	CONNECTOR, BNC, FEMALE "VIDEO OUT"
CN501	1-580-172-11	s	CONNECTOR, MICRO (RECEPTACLE) 4P "LENS"

PACKING MATERIALS & SUPPLIED ACCESSORIES

Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-7475-149-A	s	CONNECTOR ASSY, MICRO
1pc	1-580-173-11	s	CONNECTOR, MICRO (PLUG) 4P
1pc	3-173-841-01	o	ADAPTOR, C MOUNT
2pcs	3-173-961-01	o	CUSHION
1pc	3-173-969-01	o	INDIVIDUAL CARTON (for SSC-M256)
1pc	3-173-970-01	o	INDIVIDUAL CARTON (for SSC-M257CE)
1pc	3-173-971-01	o	INDIVIDUAL CARTON (for SSC-M259CE)
1pc	3-701-623-00	s	BAG, POLYETHYLENE N-EH
1pc	⚠ 3-753-909-12	s	MANUAL, INSTRUCTION
1pc	3-795-581-21	o	SAFEGUARD, IMPORTANT (for SSC-M256)